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CODE 500

Landsat 7 Processing System BDR



Landsat 7 Processing System (LPS) Build 3 Design Review (BDR)

December 11, 1996

Agenda



- n Introduction – Nate Daniel**
- n BRR Action Item Resolution – Nate Daniel**
- n System-Level Issues – Dan Ferry**
- n Subsystem Design Deltas – Subsystem Leads**
- n Documentation Plans – Dan Ferry**
- n Lessons Learned – Dan Ferry**
- n Unit Status Database – Dan Ferry**
- n Schedule – Nate Daniel**
- n Action Items and Questions – Nate Daniel**

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Build 3 Requirement Review Action Item List

Build 3 Requirement Review Action Item List		Status of Action Item
1.	Define how bands in a browse file are mapped to RGB.	Closed
2.	Verify that RDCS design handles playing back test data and LGS BERT receipt/playback.	Closed
3.	Provide delivery date for November DCN for LPS DFCB to N. Daniel as soon as possible.	Closed
4.	Write a CCR to prevent L0R parameter modifications when L0R processing is active.	Closed
5.	Provide a list of document versions to be used for Build 3 design.	Closed
6.	Provide requirements and algorithm for browse contrast stretch.	Closed
7.	Publish revised list of post-DDS functions with annotations describing the change mechanism associated with each.	Closed
8.	Take steps to provide an output file directory structure that does not place all subintervals for all processed contacts into a single directory.	Closed
9.	Write a CCR against the design to store status/error message text in database.	Closed
10.	Make writing to the trouble file optional.	Closed
11.	Provide responses to MFPS action items from preliminary and detailed design.	Closed
12.	Verify that using auto logon still permits rapid failover scenario.	Closed
13.	Determine whether MACS metadata generating functions report bands present on a subinterval or a scene basis.	Closed
14.	Include interface to LDTS communications control parameters in the LPS GUI.	Closed
15.	Provide preliminary report contents to EDC for review by December or January.	Closed
16.	Provide responses to MACS/UI issues from preliminary and detailed design and database issues from preliminary design.	Closed
17.	Verify that Landsat 7 calibration file version number is reported in metadata.	Closed
18.	Ensure that small subintervals are deleted at the end of a contact.	Closed
19.	Provide responses to system-level action items from preliminary design (denoted SYS-n) and "general" issues from the DDS by BDR.	Closed
20.	Contact R. Irish and verify that the radiometric correction algorithm for browse is the same as the one for ACCA.	Closed
21.	Define bit error rate computation for reports.	Closed
22.	Tell EDC to write a CCR against documentation/detailed design to provide the capability to insert lines into the LPS journal.	Closed
23.	Ensure that UIF supports method for determining what DANs have not been sent.	Closed
24.	Ensure that ldt_rcvDDN does not lose DDNs when the system crashes, when the operator shuts down the LPS software, or when the operator disables (and thus kills) the DDN server.	Closed
25.	Provide responses to LDTS issues from preliminary and detailed design.	Closed
26.	Revise ldt_rcvDDN to handle duplicate DDNs.	Closed
27.	Provide responses to IDPS action items from preliminary and detailed design.	Closed
28.	Track ECS response to question of how days beyond the end of the year are to be output and provide response to developers.	Response under review
29.	Provide responses to RDCS action items from preliminary design.	Closed
30.	Verify that capture device API is as agreed on at 11/22/95 meeting with C. Brambora and T. Potthast.	Closed
31.	Define fill values for MSCD and PCD files.	Response under review
32.	Determine what time the PCDS will transmit to the IDPS when a partial scene does not contain the center.	Closed
33.	Define coordinates for corners of partial scenes (first/last actually present scan line versus nonexistent full scene corner).	Closed
34.	Provide responses to PCDS action items from preliminary and detailed design.	Closed
35.	Provide responses to RDPS action items from preliminary design.	Closed

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System-Level Issues



- n **Temporary and L0R file clean-up**
- n **End of contact with no accompanying data**
- n **Partial scene centers**

Temporary and L0R File Clean-Up



- n **Problem (LPSI960127)**
 - RDCS temporary files not deleted
 - Files from interrupted L0R not deleted
- n **Candidate solutions**
 - Individual subsystems perform clean-up
 - MACS performs clean-up
- n **Selected solution: MACS cleans up at beginning of run**
- n **Subsystem affected: MACS**

End of Contact With No Accompanying Data



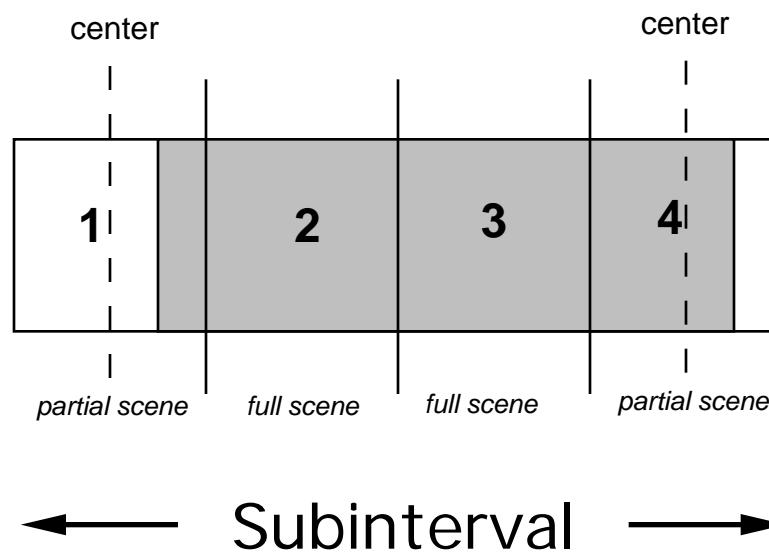
- n **Problem (LPSI960063): L0R processes have to be killed manually when RDPS quits without sending any data to MFPS due to an empty raw data file**
- n **Candidate solutions**
 - RDPS sends a special CADU to MFPS indicating end of contact with no data; MFPS then informs PCDS and IDPS
 - RDPS returns a special status to MACS indicating an empty raw data file; MACS then kills all active L0R subsystems
- n **Selected solution: RDPS returns a special status to MACS**
- n **Subsystems affected: MACS and RDPS**

Partial Scene Centers



- n **Problem: Determine times, coordinates, etc. for scenes found at beginnings and ends of subintervals**
 - At start of subinterval, beginning of scene missing
 - At end of subinterval, end of scene missing

Subinterval With Partial Scenes





- n Candidate solutions
 - Extrapolate times and coordinates for all partial scenes
 - Base times and coordinates on data, not hypothetical full scene
 - Hybrid approach
- n Selected solution: Hybrid approach

Partial Scene Center Resolution



- n **Time, latitude, and longitude:** As if for a full scene
- n **Scene center scan number**
 - Center outside data: Use zero to indicate extrapolation
 - Center inside data: Use index of scan line closest to center (as if for full scene)

Partial Scene Corner Resolution



- n **Scene boundary times and corner latitudes and longitudes will reflect actual data, not hypothetical full WRS scene**
- n **Scene boundary indexes will reflect those scan lines whose times are closest to times computed for scene boundaries**

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- n **Global IPC facilities**
 - LPS shared memories controlled by semaphores
 - Uses static addresses for shared memory
 - LPS FIFO queues
- n **Global database table access subroutines**
- n **Global process initialization and handling subroutines**
- n **Message logging subroutines**
- n **Global time manipulation subroutines**
- n **Global header files**

***Globals New Functionality for Build 3,
Release 2***



- n **Global process initialization and handling subroutines**
 - Add capabilities for `Ips_ParseOptions` to handle more arguments types and processes to match IDD
- n **Global time manipulation subroutines**
 - New time function, `Ips_TimeScanSecond`, to convert ETM+ time to seconds since midnight on January 1, 1993



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MACS Release 1 Accomplishments



- n **Start LPS**
- n **Shut down LPS**
- n **Start L0R processing**
- n **Stop L0R processing**
- n **Generate metadata file**
- n **Graphical user interface using Forms 4.5**
 - **Control**
 - **Start capture**
 - **Stop capture**
 - **Start L0R processing**
 - **Stop L0R processing**

MACS Release 1 Accomplishments (Cont'd)



- n **Graphical user interface using Forms 4.5 (cont'd)**
 - **Monitor**
 - **Display LPS journal file**
 - **Display operational messages**
 - **File management**
 - **Start DDN server**
 - **Stop DDN server**
 - **LPS shutdown**



n **User interface**

– **Setup**

- **View/edit capture source**
- **Ingest contact schedules**
- **View/edit contact schedules**
- **Load IAS parameter file**
- **Propagate L0R parameters**
- **View/edit L0R parameters**
- **View/edit L0R thresholds**
- **View/edit output file transfer configuration**



n **User interface (cont'd)**

– **Control**

- Start and stop copy to tape
- Start and stop restage
- Start and stop auto capture
- Generate tape label

– **Report**

- Data receive summary
- LPS quality and accounting
- File transfer summary

– **Test**



- n **User interface (cont'd)**
 - **File management**
 - Set DAN transfer state flag
 - Resend suspended DAN
 - Resend failed DAN
 - Set output file deletion flag
 - Delete output file set
 - Delete raw file
- n **Ingest contact schedule file and IAS parameter file to specified strings**
- n **Color distinctions for priorities on status and error messages**

***MACS New Functionality for Build 3,
Release 2 (Cont'd)***



- n Auto data capture (invokes data capture, L0R and tape archival processes)
- n Delete files associated with small subintervals (threshold that can be set by operator)

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Data Receive Summary Report



Data Receive Summary Report

Capture String: XXXXXXXXXXXXXXXXXXXX
Capture Source: XX
Raw Data File Name: XXXXXXXXXXXXXXXXXXXX
Scheduled Start Time: DD-MON-YY-HH:MM:SS
Scheduled Stop Time: DD-MON-YY-HH:MM:SS
Actual Start Time: DD-MON-YY-HH:MM:SS
Actual Stop Time: DD-MON-YY-HH:MM:SS
Scheduled Volume (Mbytes): NNNNN.NN
Number of Scheduled Scenes: NNNN.NN
Expected Volume (Mbytes): NNNNN.NN
Number of Expected Scenes: NNNN.NN
Received Volume (Mbytes): NNNNN.NN
Number of Received Scenes: NNNN.NN
Transmission Rate(MBytes/Sec): NNNNN.NN

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LPS File Transfer Report



LPS File Transfer Report

Date: YYYY DDD

Available Files	Transmitted Files
-----------------	-------------------

Band	NNNN	NNNN
PCD	NNNN	NNNN
MSCD	NNNN	NNNN
Browse	NNNN	NNNN
Metadata	NNNN	NNNN
Calibration	NNNN	NNNN
Total Files	NNNN	NNNN

Available File Names **Transmitted File Names**

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LPS Quality and Accounting Report



LPS String ID: XXXXXXXX

LPS Quality & Accounting Report

Report Date: YYYY DDD HH:MM:SS

Capture File: AAAAAAAAAAAAAAAA
Capture String: XXXXXXXX
Contact Start: YY DDD HH:MM:SS
Contact Stop: YY DDD HH:MM:SS
Data Volume (MBytes): NNNN.NN

Tolerances
Search: N Flywheel: N
Check: N Check Error: N
Bit Slip Ext: N Lock Error: N

SI	Subinterval	Subinterval	CADUs	MBytes	Scenes	Total	Fill	MJF	MJF	MJF	CADU Quality									
											Part	All	Sync	RS	RS	RS	BCH	BCH	BCH	BCH
No.	Start	Stop						Fill	Errs	Flywhl	Missing	Fmt 1	Fmt 2	Uncorr	Data Zn	Pntr	Data Zn	Pntr	(%)	
1	YY DDD HH:MM:SS.MMM	YY DDD HH:MM:SS.MMM	NNNNNNNN	NNNN.NN	NNN	NNNNNNNN	NNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN
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4	YY DDD HH:MM:SS.MMM	YY DDD HH:MM:SS.MMM	NNNNNNNN	NNNN.NN	NNN	NNNNNNNN	NNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN
TOTAL			NNNNNNNN	NNNN.NN	NNN	NNNNNNNN	NNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN	NNNNNNNN



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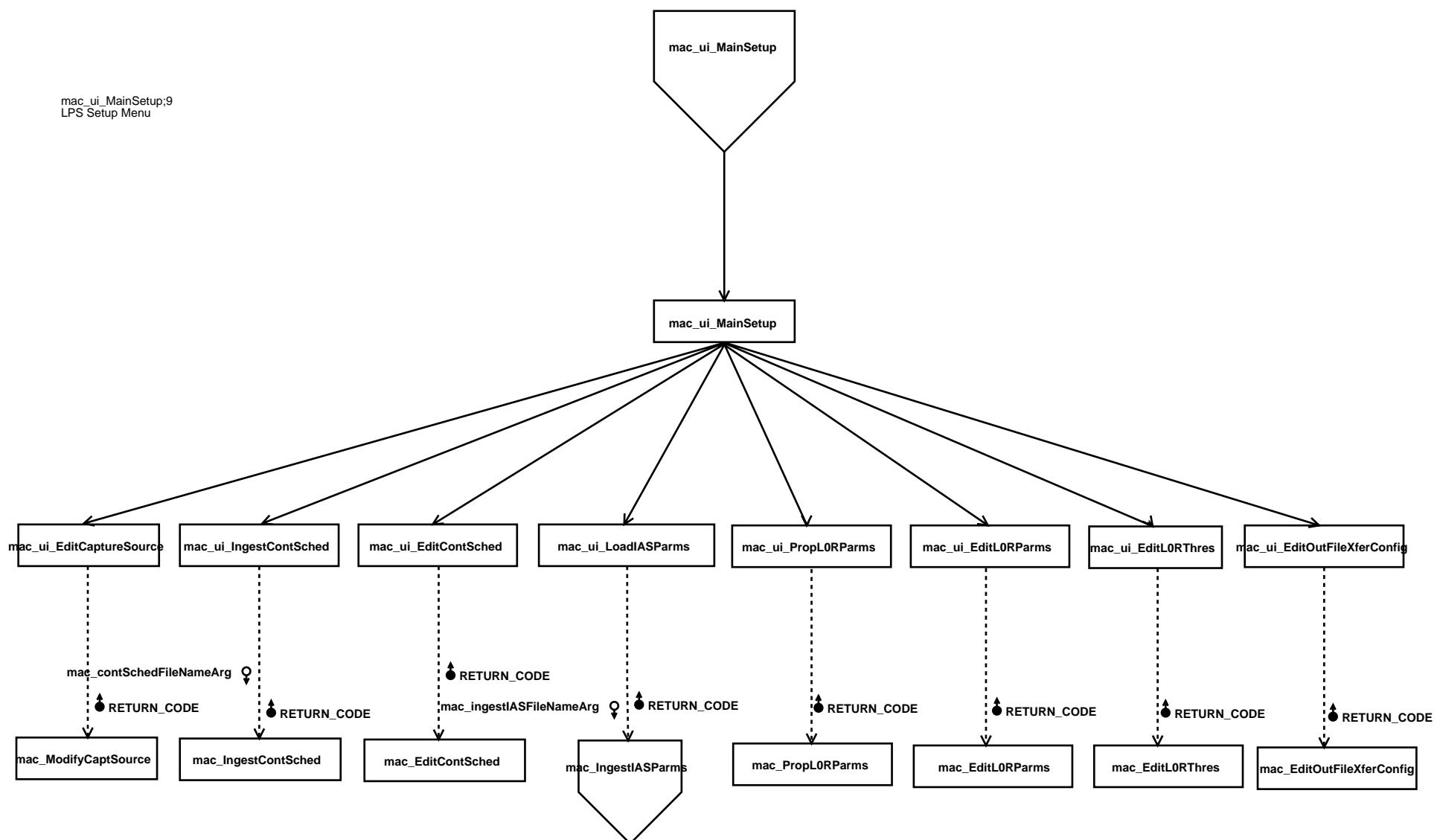
- n **Generated LPS database creation scripts**
 - **User**
 - **Role**
 - **Privilege**
 - **Table space**
 - **Table**
 - **Constraints**
 - **Synonym**
 - **Sequence**
- n **Generated static data load scripts**

***Database New Functionality for Build 3,
Release 2***

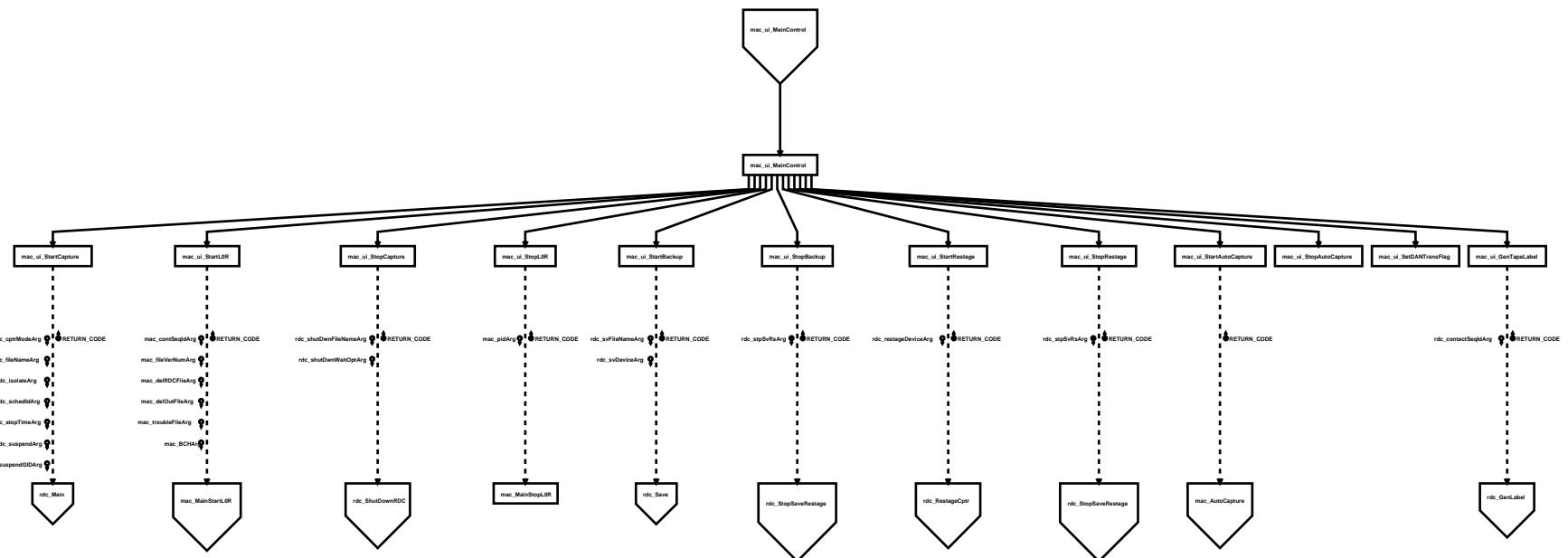


- n Set up full data constraints
- n Create additional table creation scripts
- n Purge LPS database
- n Enhance performance and fine tune

LPS Setup Menu

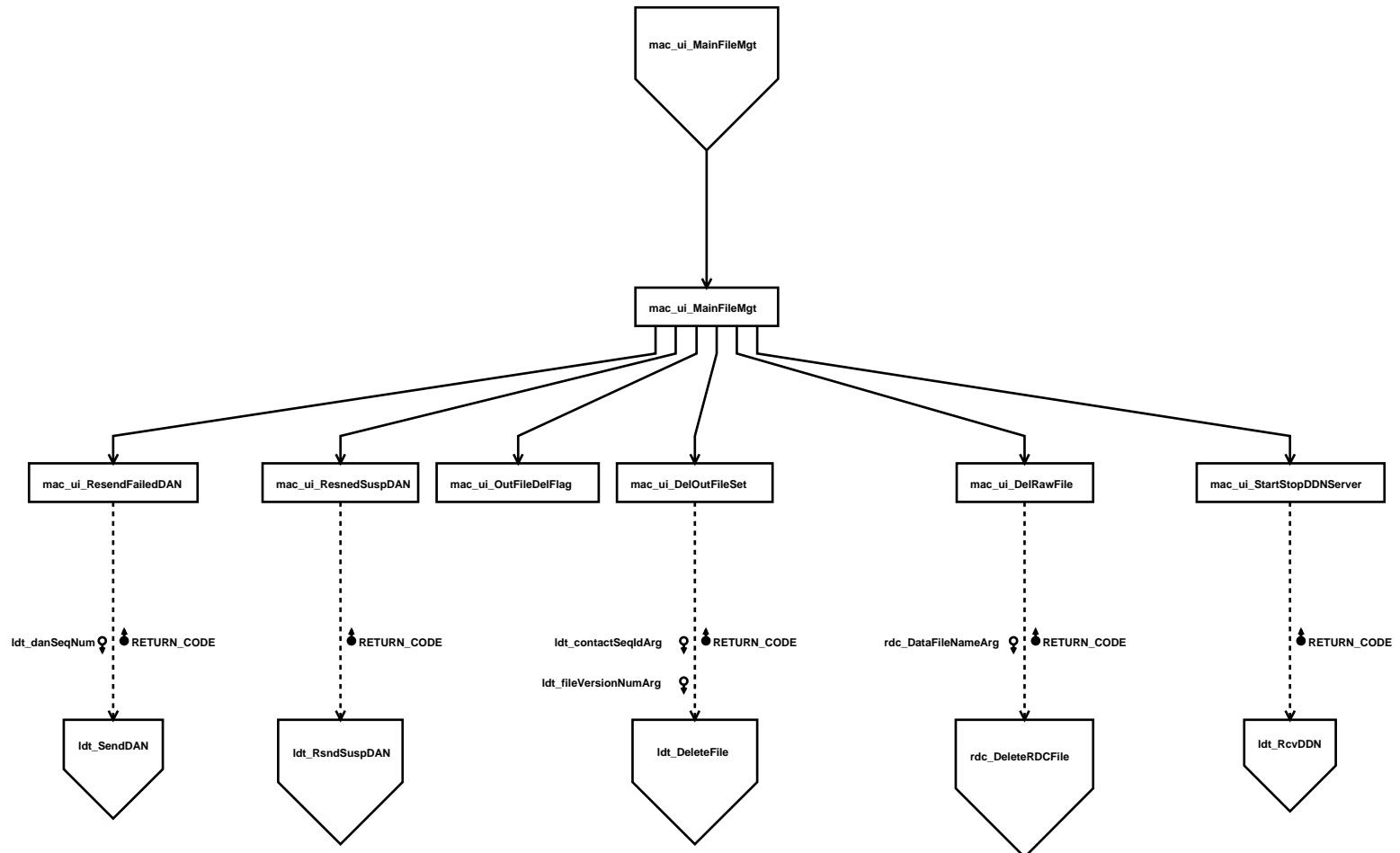


mac_ui_MainControl



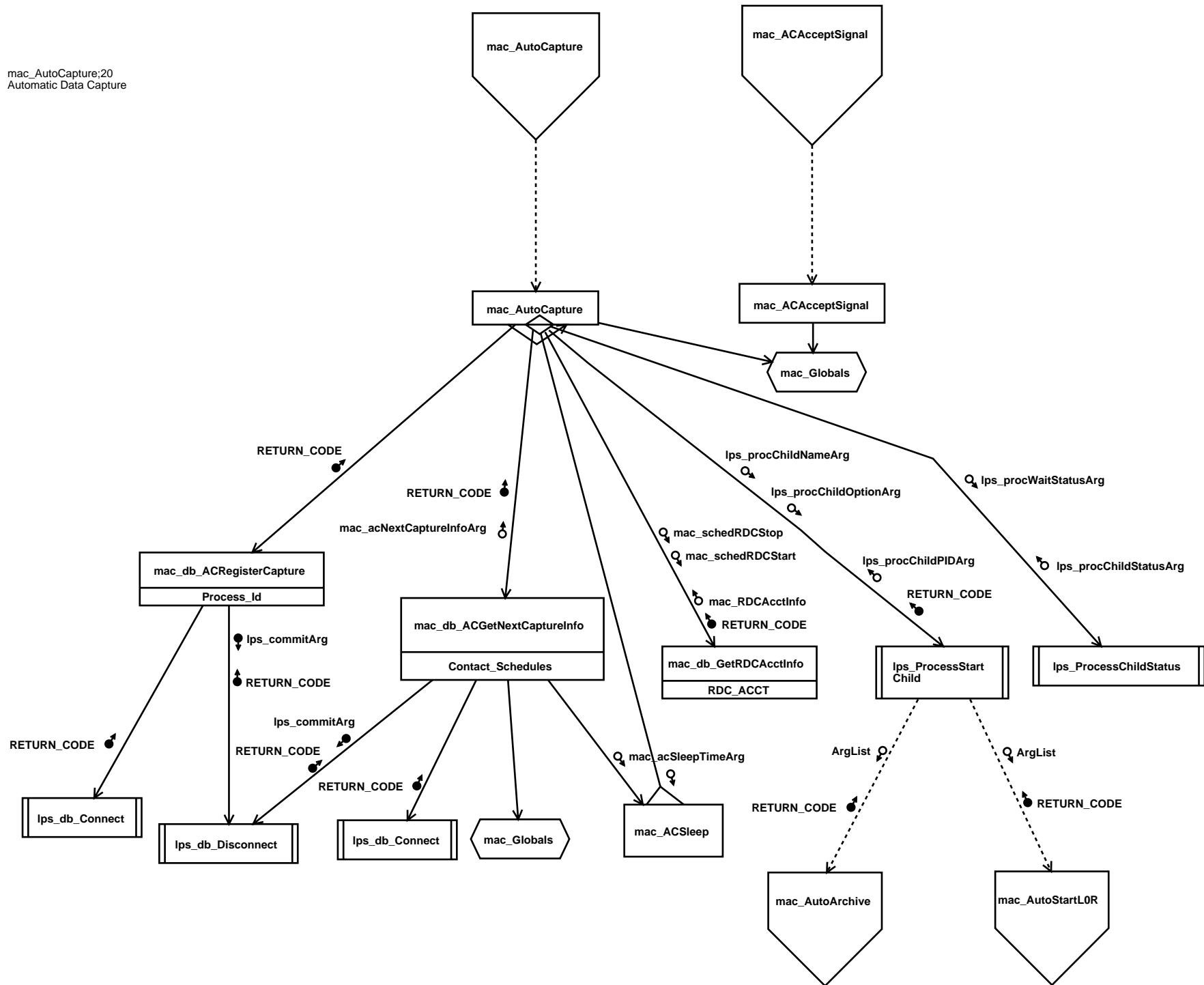
LPS File Management Menu

mac_ui_MainFileMgt:26
LPS File Management Menu



Automatic Data Capture

mac_AutoCapture;20
Automatic Data Capture





Auto Tape Archive





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n **Complete functionality**

- **Real-time raw data capture using Mizar card capture device**
- **Verification of adequate disk space on front-end raid prior to data capture**
- **Timeout capability in case of aborted captures**
- **User manual shutdown capability in case of aborted captures**
- **Command line execution capability**

RDCS Release 1 Accomplishments (Cont'd)



n Resolve ICCRs

- LPSI960029: Shutdown process not started and no error message generated**
- LPSI960031: RDCS aborted with capture device write error**

n Resolve RIDs

- 11-29-95-037: Check disk space prior to data capture**

***RDCS New Functionality for Build 3,
Release 2***



- n **Provide RDCS capability to play back raw data through HPDI card and onto another LPS processing string**
- n **Perform all RDCS accounting functions**
- n **Save raw data and RDCS accounting files to tape, including tape label generation**
- n **Restage raw data and RDCS accounting files from tape to online disk**
- n **Integrate DLT jukebox into RDCS archival and data restage functions**
- n **Automatically delete raw data and RDCS accounting files following L0R processing and saving of these files to tape**

***RDCS New Functionality for Build 3,
Release 2 (Cont'd)***



- n **Provide manual raw data file deletion capability via user interface**
- n **Suspend L0R subsystem processing during raw data capture**
- n **Isolate RDCS to dedicated processor during raw data capture**
- n **Check for adequate disk space on system disk**
- n **Generate Data Receive Summary Report**

RDCS Design Changes



- n **Modify RDCS capture to perform data capture using HPDI card data capture device in place of Mizar card data capture device**
- n **Modify RDCS shutdown function to use signal handling in place of one-way-file-polling method**

***RDCS ICCRs To Be Resolved in Build 3,
Release 2***



- n **LPSI960028:** Message text missing from rdc_MizarFunctions.c:212
- n **LPSI960060:** Two copies of rdc_PIDTempFile created

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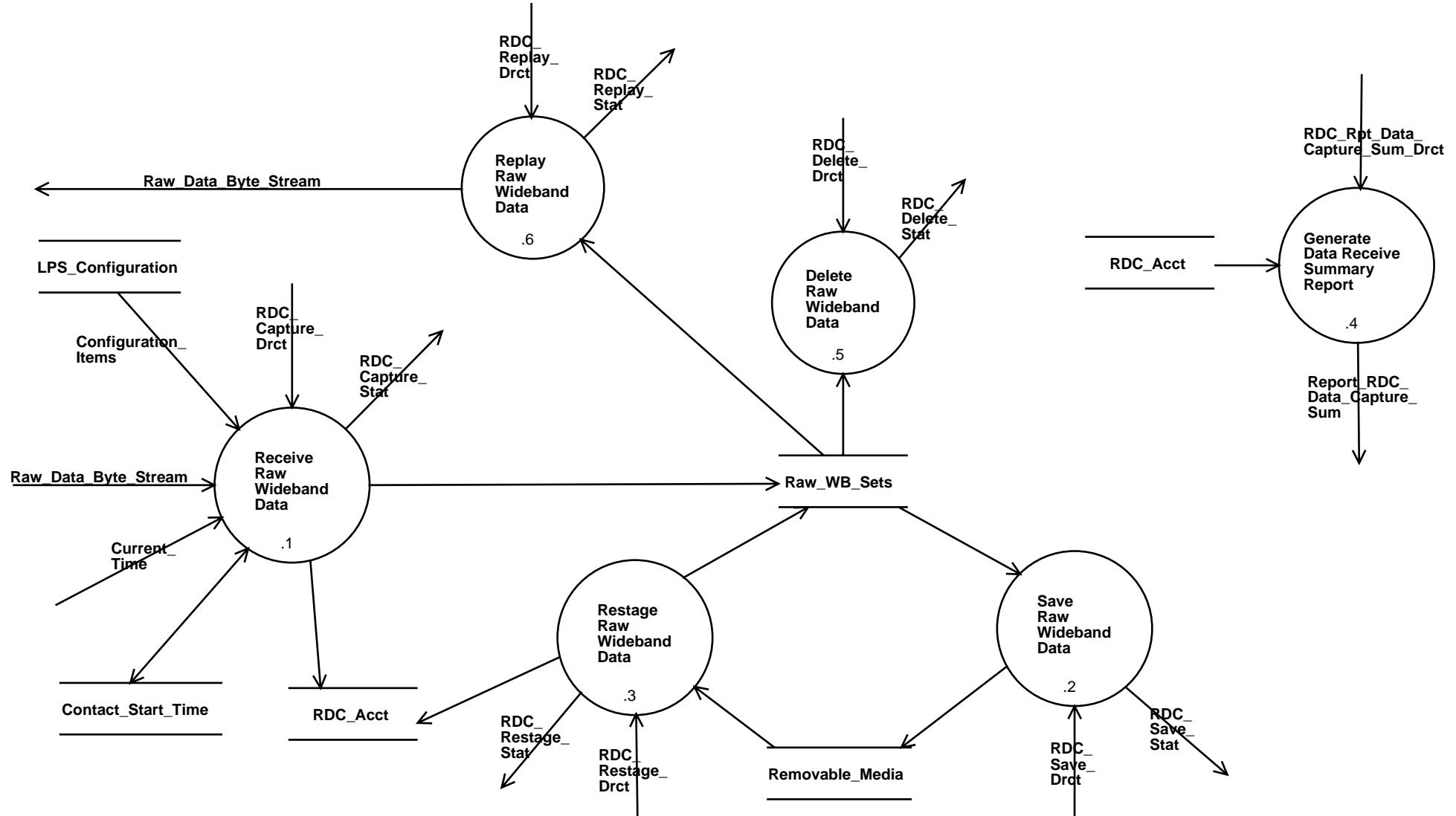
RIDs To Be Resolved in Build 3, Release 2



- n 11-29-95-029: DLT drives on LPS strings
- n 11-29-95-037: Check system disk space prior to data capture

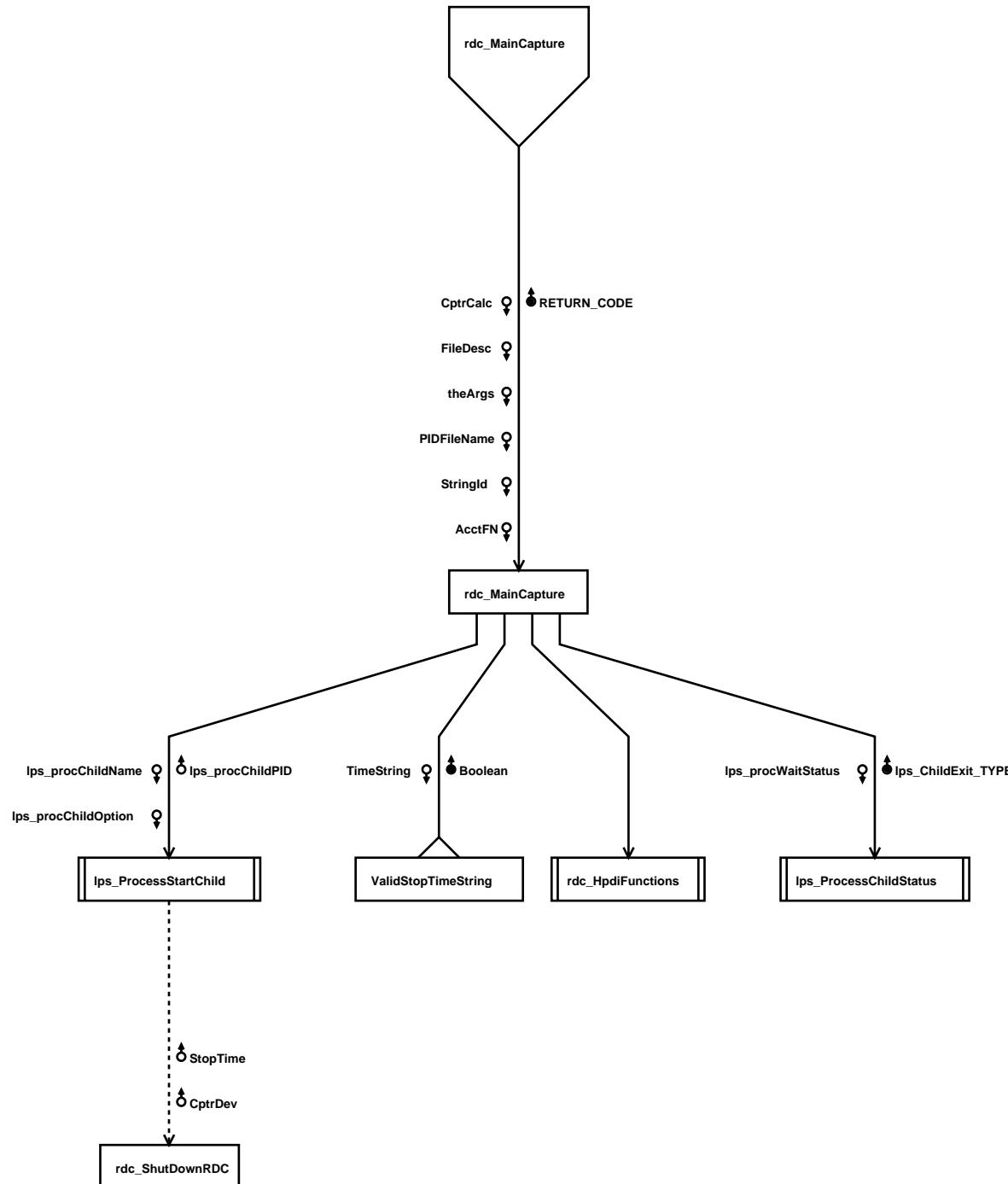
Raw Data Capture Subsystem

1:22
Raw Data Capture Subsystem



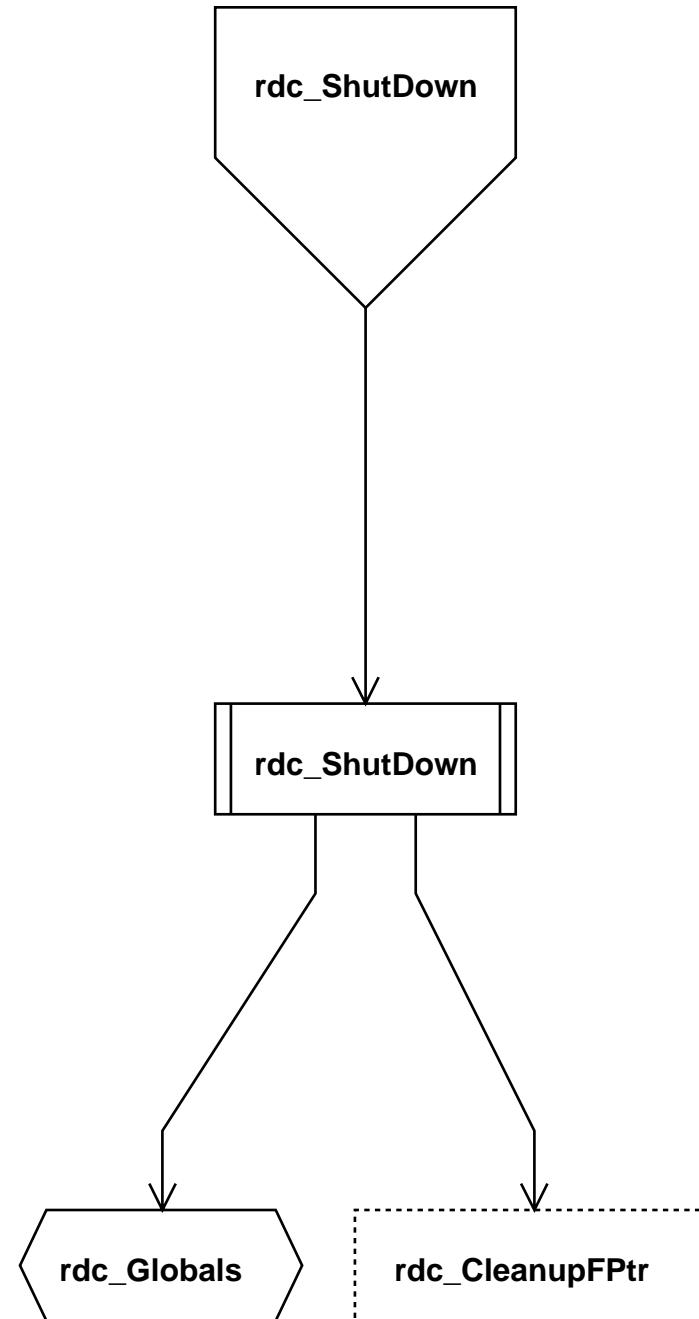
Capture Raw Wideband Data - Capture Loop

rdc_MainCapture;34
Capture Raw Wideband Data - Capture Loop

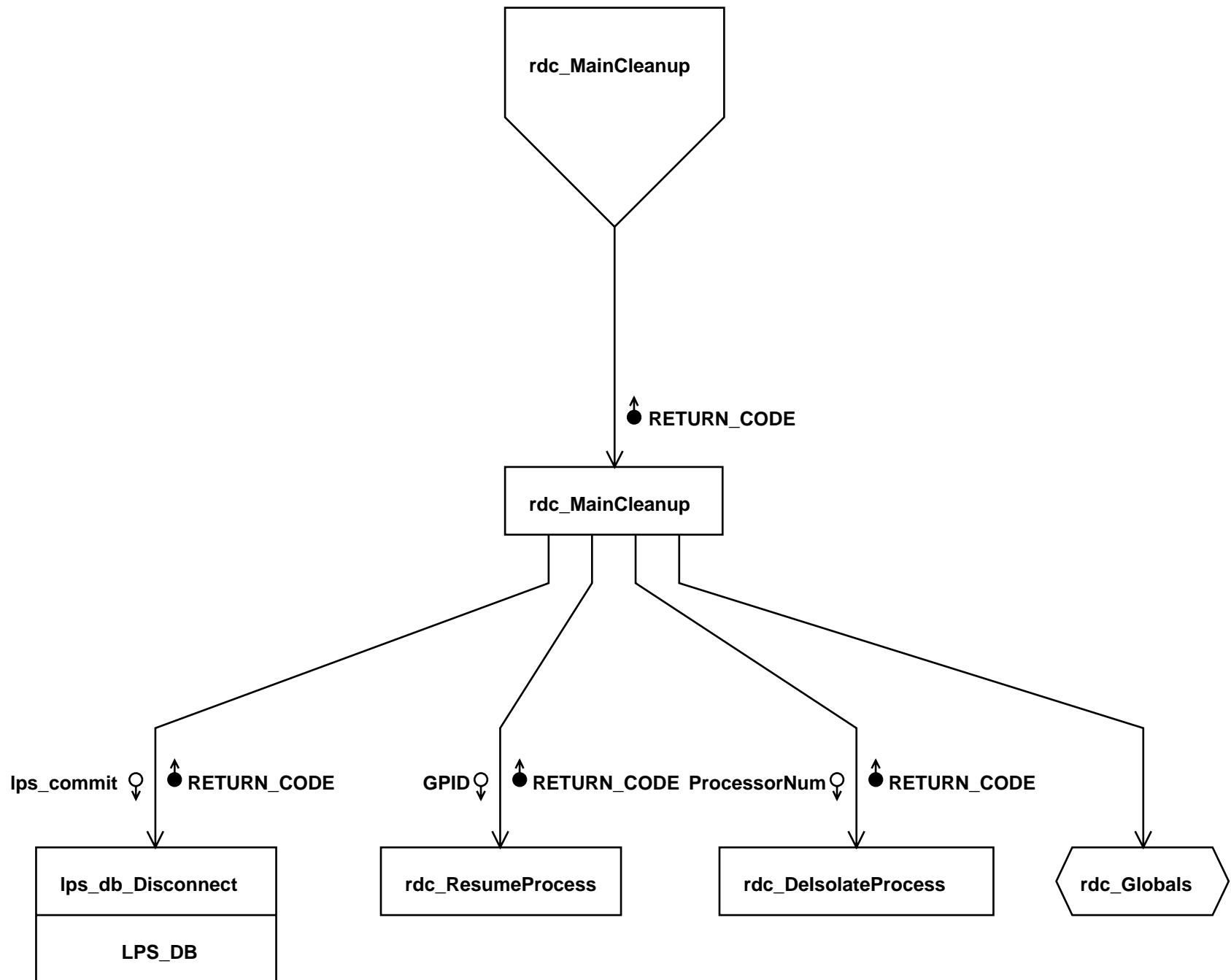


Generic RDCS Shutdown

rdc_ShutDown;5
Generic RDCS Shutdown

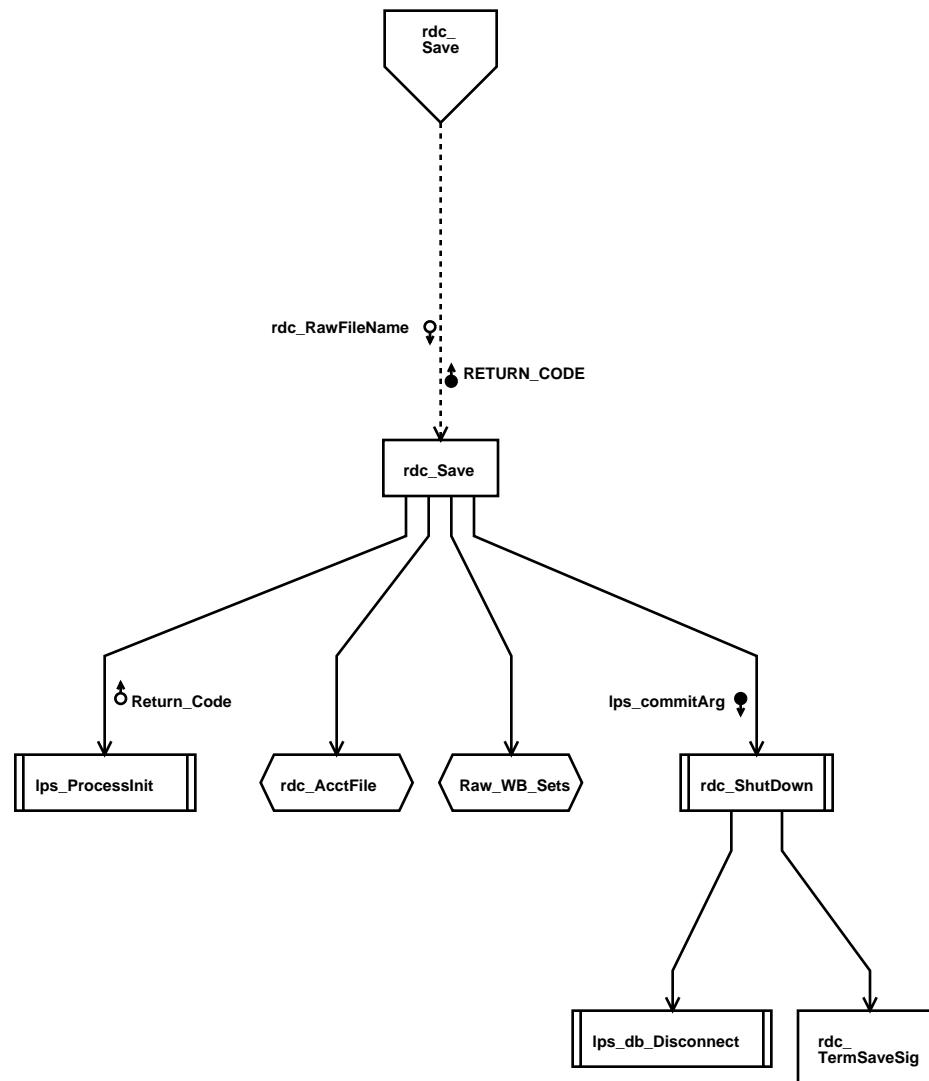


rdc_MainCleanup;3
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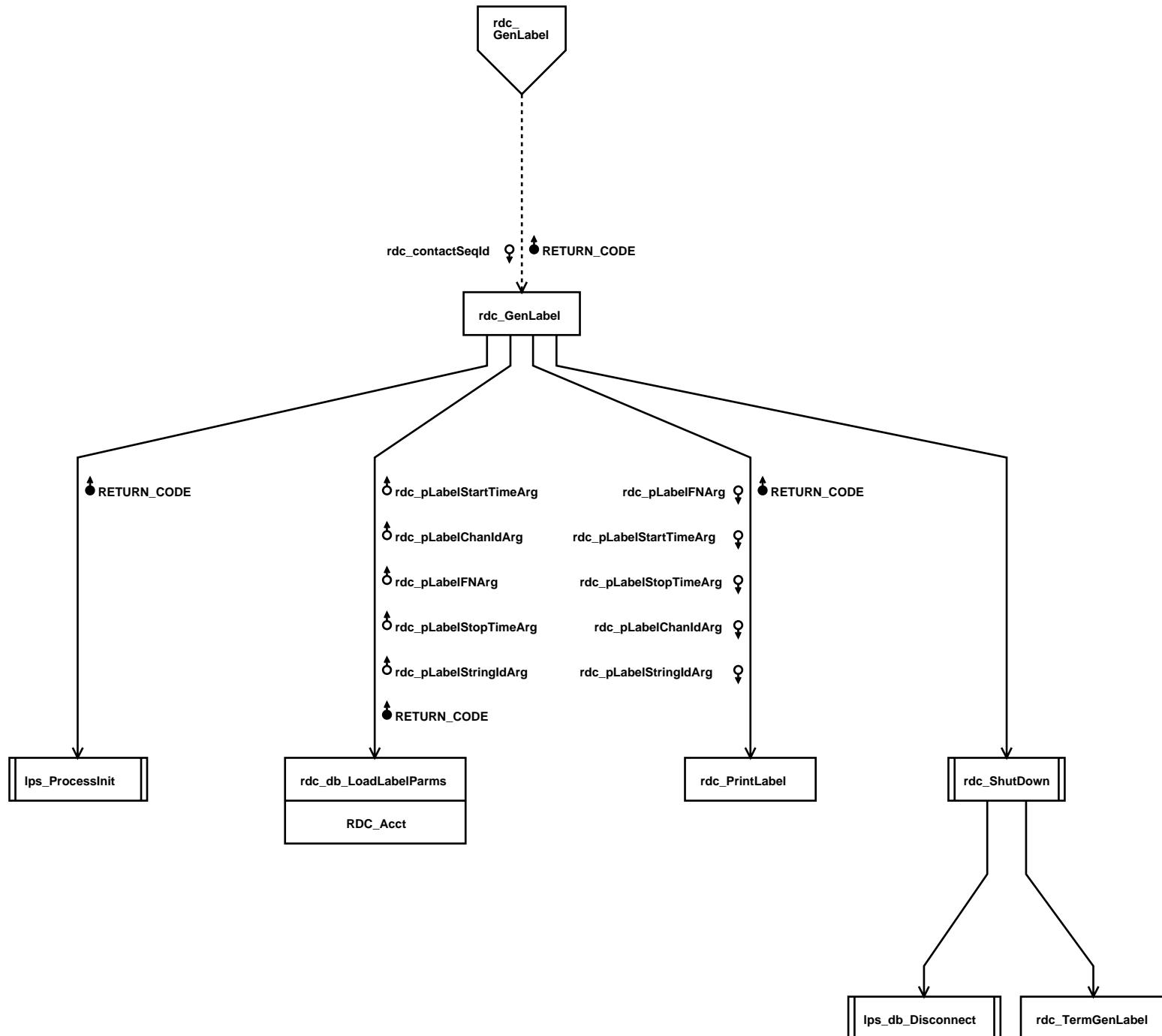
No Title

rdc_Save;44
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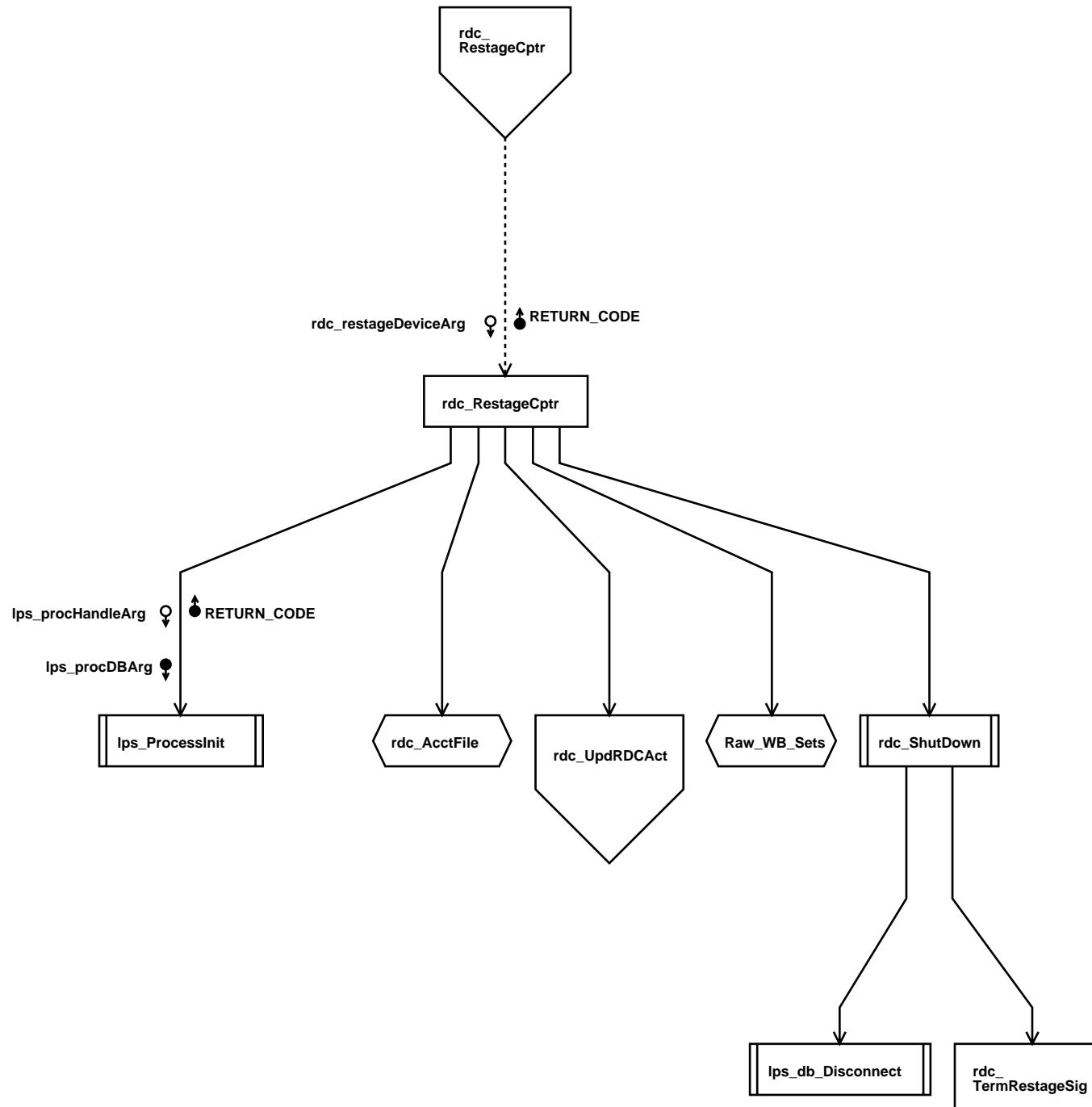
No Title

rdc_GenLabel;18
No Title



No Title

rdc_RestageCptr;30
No Title





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RDPS Release 1 Accomplishments



- n **Completed all functionality**
- n **Resolved ICCRs**
 - **LPSI960056: Version number file errors not corrected**
 - **LPSI960072: Reed-Solomon errors reported incorrectly**

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RDPS Design Changes



- n **Make trouble file generation optional**
- n **Send unique return status to MACS signifying end of contact without valid CADUs**

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***RDPS ICCR To Be Resolved in
Build 3, Release 2***



- n **LPSI960059: Flag VCDU Header Error Control field with more than three bit errors as not correctable**



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MFPS Release 1 Accomplishments



- n Identify VCDUs
- n Extract PCD
- n Parse major frame
 - Identify major frames
 - Extract major frame time
 - Collect VCDU quality and accounting
 - Determine subinterval
- n Generate band data
 - Deinterleave and reverse bands
 - Align bands



- n **Extract calibration and MSCD**
 - Extract calibration data
 - Create calibration file
 - Create MSCD file
 - Extract MSCD data
- n **Collect quality and accounting (except threshold tests)**



- n **LPSI960034:** Mjf not put in trouble file
- n **LPSI960036:** No SubIntv for format change
- n **LPSI960037:** SubIntv table has incorrect time values
- n **LPSI960047:** Last Mjf not included in MSCD file
- n **LPSI960049:** No SubIntv for time jump
- n **LPSI960050:** Error inserting SubIntv information into database
- n **LPSI960061:** MSCD file name is hard coded
- n **LPSI960062:** MSCD file not conforming to DFCB
- n **LPSI960064:** No MFPS output for VCDU counter rollover
- n **LPSI960065:** Hard coded tolerance for number of Mnfs



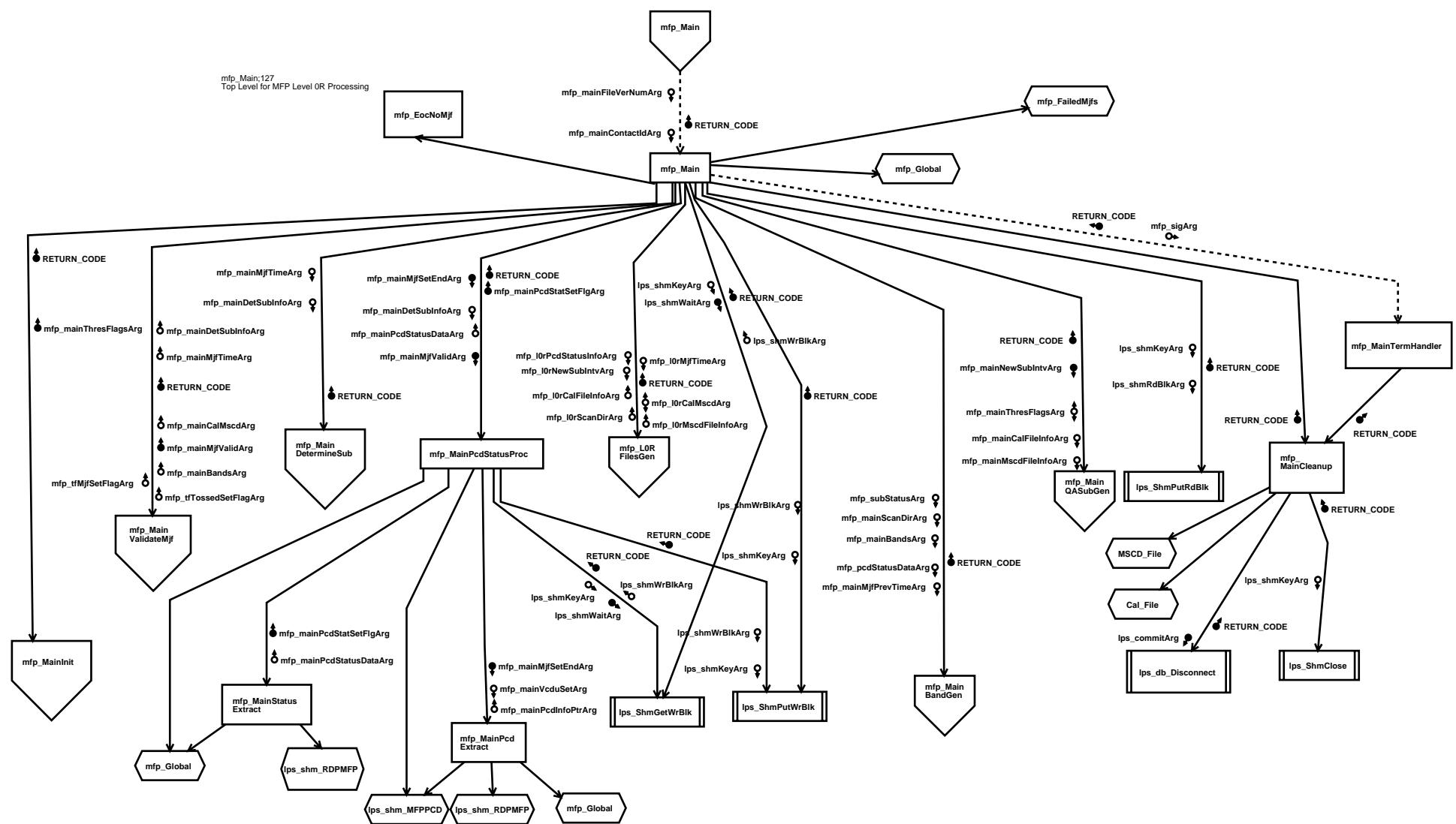
- n **LPSI960067:** LPS does not assign a year to data
- n **LPSI960068:** Incorrect Mnf counter corrections
- n **LPSI960074:** FHSERR and SHSERR wrongly calculated

***MFPS New Functionality for Build 3,
Release 2***

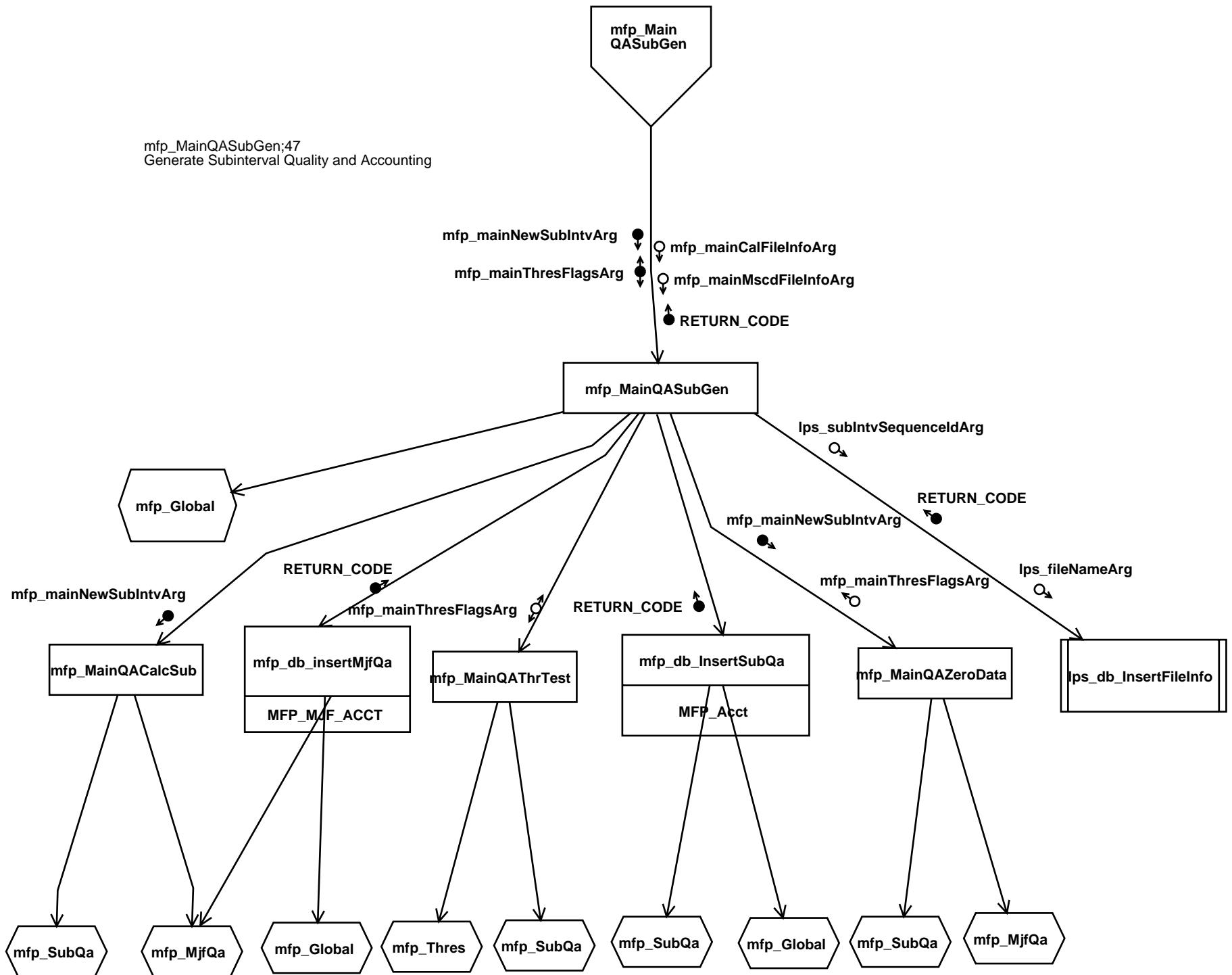


- n Validate MFP parameters
 - Use database parameters for L0R processing
- n Determine error thresholds
 - Use database thresholds for L0R processing
 - Test errors against thresholds
- n Generate LPS metadata file
 - Insert quality assurance data into database on major frame basis

Top Level for MFP Level 0R Processing



Generate Subinterval Quality and Accounting



***MFPS ICCRs To Be Resolved in Build 3,
Release 2***



- n **LPSI960035:** Trouble file opened in Append mode
- n **LPSI960040:** Provide capability to manually stop data processing without errors
- n **LPSI960041:** mac_stopL0r did not shut down MFPS cleanly
- n **LPSI960048:** No MSCD file created if data crosses year boundary
- n **LPSI960052:** Unable to write to MSCD file
- n **LPSI960053:** L0R processing failed with data containing errors in frame sync pattern
- n **LPSI960054:** Failure with data having VCID errors
- n **LPSI960055:** Failed to handle data with fill VCDUs

***MFPS ICCRs To Be Resolved in Build 3,
Release 2 (Cont'd)***



- n **LPSI960057:** Mjfs duplicated in MSCD file
- n **LPSI960058:** Failed to process data containing one CADU of inverted polarity
- n **LPSI960063:** Processing empty raw data file
- n **LPSI960066:** Need for error-handling strategy
- n **LPSI960069:** Incorrect values for Mjf period and tolerance
- n **LPSI960073:** First major frame always thrown out
- n **LPSI960075:** Time code format changed

MFPS Open Issues



- n Scan direction value when not all eight word groups give same bit value after majority vote
- n Clarifications of mfp_mjf_acct table fields
- n Maximum number of minor frames in a major frame
 - Approach: Assume to be 8000

Scan Direction Value When not All Eight Word Groups Give Same Bit Value After Majority Vote



n **Example:**

Word group numbers: 1 2 3 4 5 6 7 8
Bit values: 1 1 0 1 1 1 1 1 scan dir?

or

Bit values: 1 1 0 1 1 0 0 1 scan dir?

n **Approach:** MFPS will apply majority vote algorithm to the eight bit values. If the algorithm fails to yield a scan direction value, it will be derived from previous major frames. Vote tolerance will be a parameter that a user can set.



Clarifications of mfp_mjf_acct table Fields

- n **MFP rejects major frame with time code errors, sync errors, or EOL errors; rejected and missing major frames replaced with entirely filled major frames**
- n **For such entirely filled major frames, Mjf_Filled_Flag field for entry in mfp_mjf_acct table will always be filled, with the following exception: all other fields will have NULL values**
- n **For major frames discarded due to time code errors, ETM_Timecode_Error_Flag field also will be filled for entry in mfp_mjf_acct table**



- n **Globals – Viet Trinh**
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- n **PCDS – Dennis Crehan**
- n **IDPS – Mike Reid**
- n **LDTs – Myron Huang**

PCDS Release 1 Accomplishments



- n **Build PCD cycles, convert to EUs, store in PCD file**
- n **Interpolate WRS scene centers without UT1 correction**
- n **Create full scene corners**
- n **Report scene metadata**

***PCDS New Functionality for Build 3,
Release 2***



- n UT1 corrections from database
- n Parameters and thresholds from database
- n Threshold value in error messages

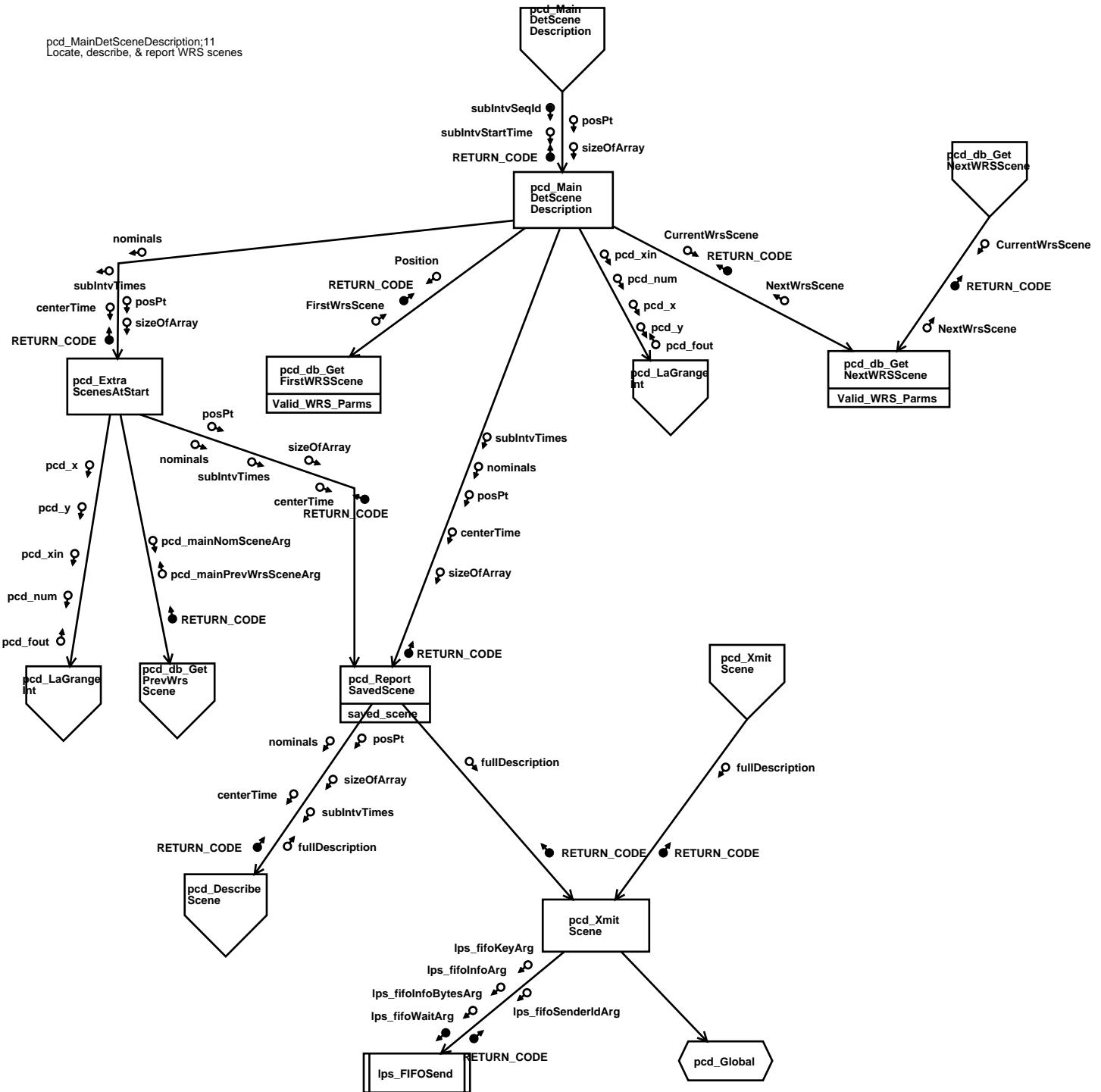


- n **Partial scene handling**
 - **On first interpolated scene, extrapolate centers to subinterval start**
 - **At end of subinterval, extrapolate centers to subinterval end**
 - **Delay scene publication until next scene or end of subinterval to determine later scene corner**
 - **Use subinterval time boundaries to truncate partial scenes**
 - **Subinterval start time for scene start**
 - **Next scene time or subinterval stop time for scene end**
- n **End of contact notification to IDPS in end-of-subinterval message**



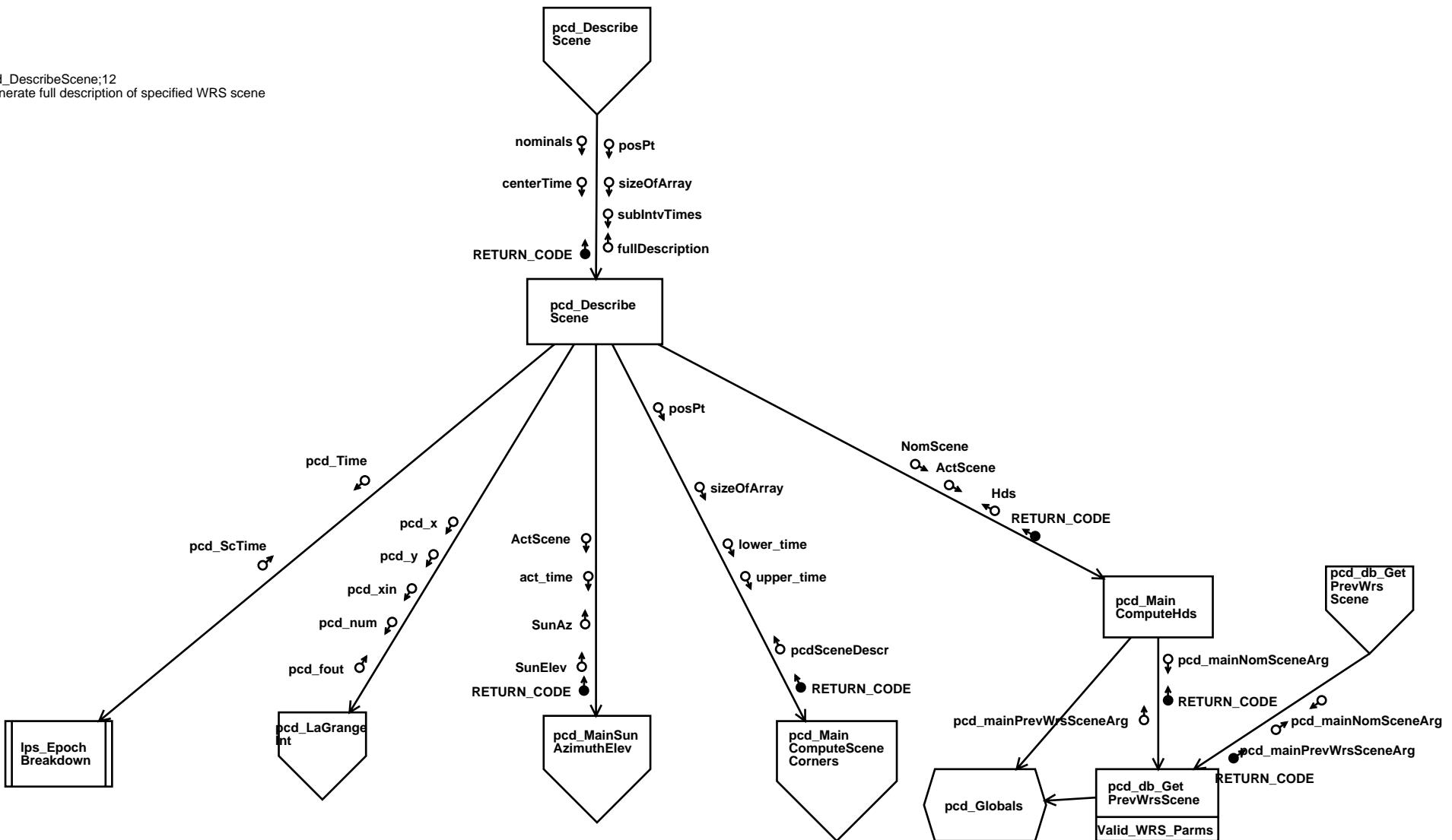
- n **New PCD fill values are TBR**
 - **Issue: New approach specified late and not yet accepted**
 - **Approach: Use/convert operator-specified fill pattern**
- n **Retaining major frames prior to first valid major frame 0**
 - **Issue: Discussed at PDR, but not incorporated in design**
 - **Approach: Discard major frames until first valid major frame 0**

Locate, describe, & report WRS scenes



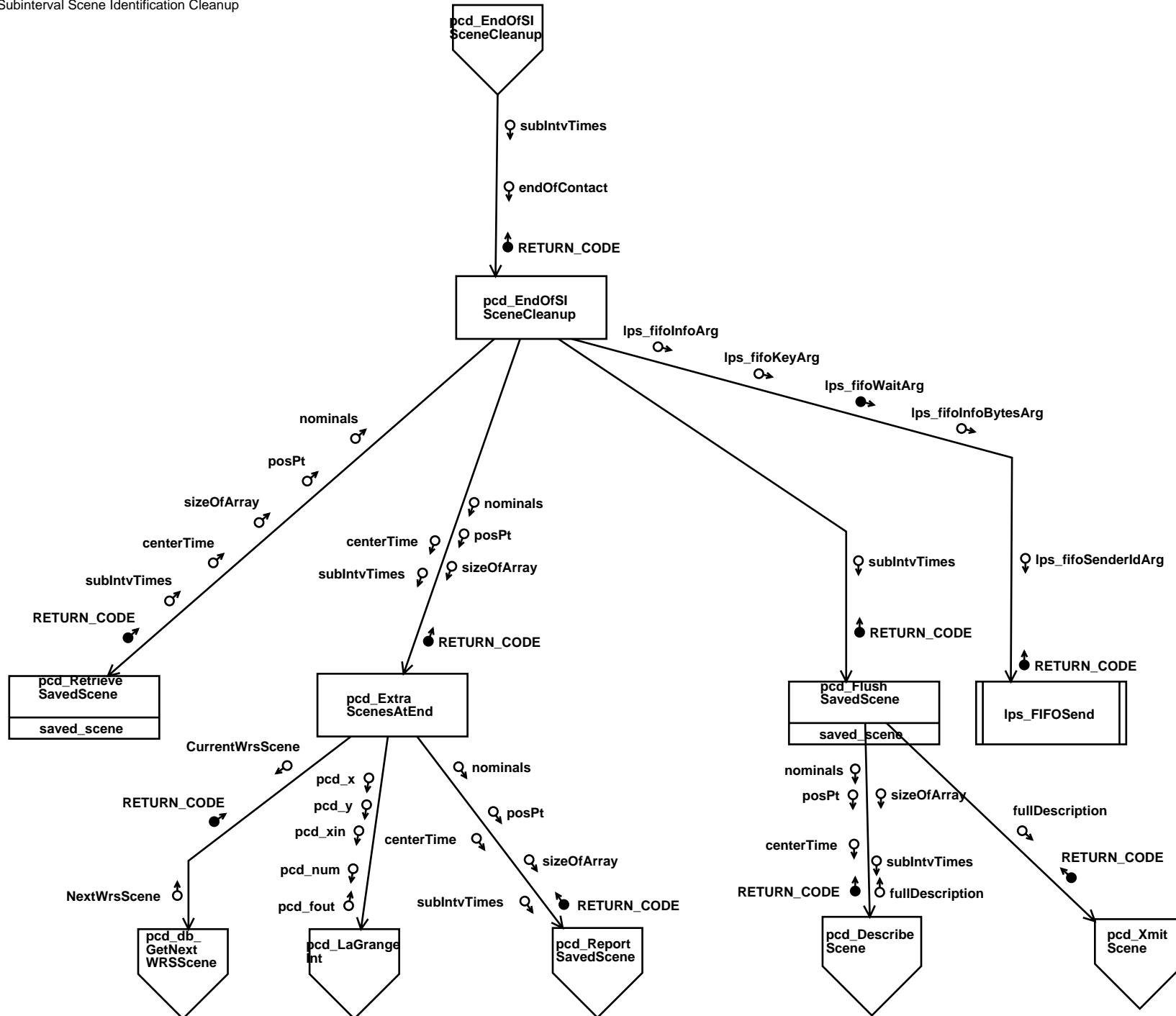
Generate full description of specified WRS scene

pcd_DescribeScene;12
Generate full description of specified WRS scene



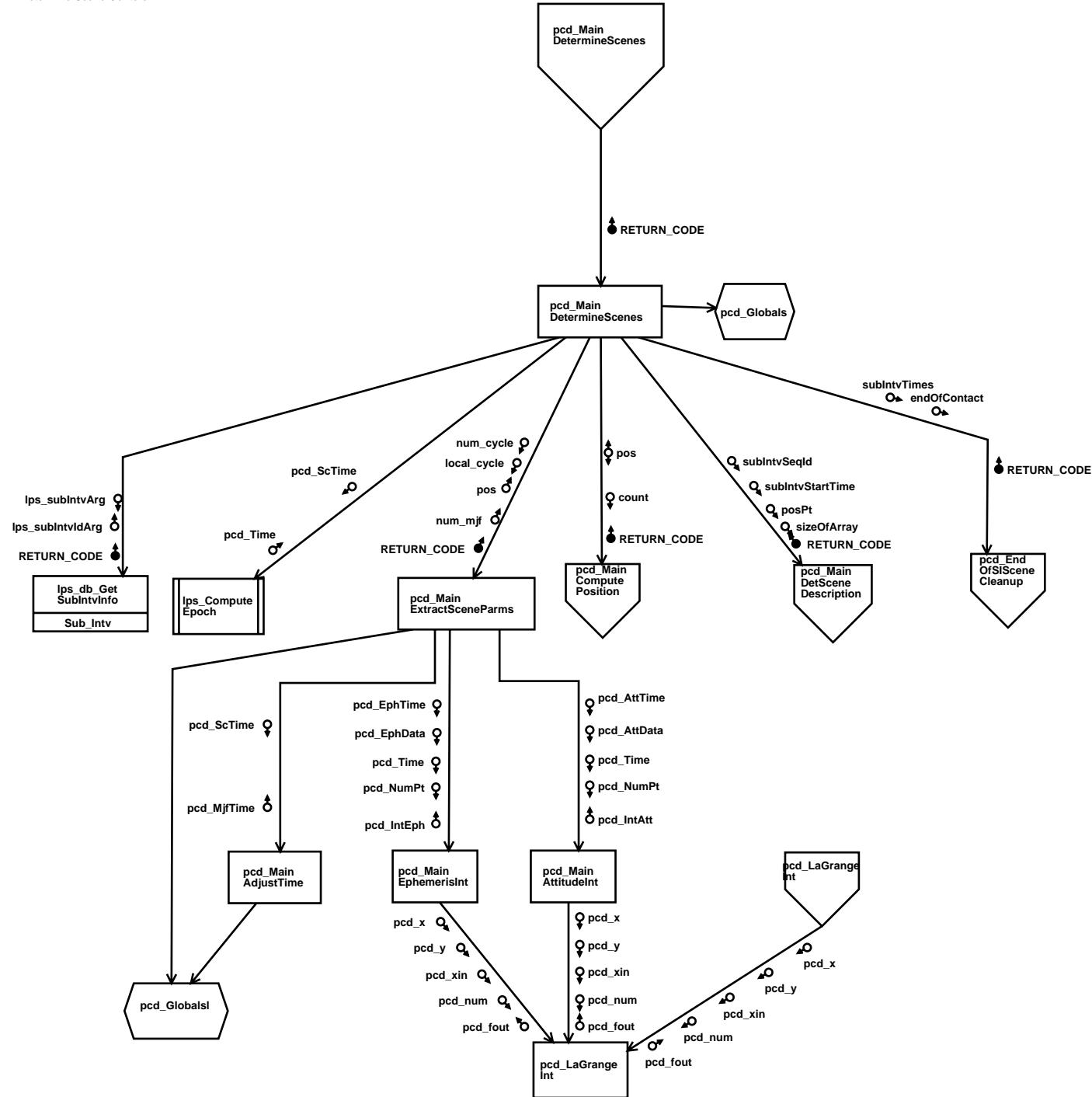
End of Subinterval Scene Identification Cleanup

pcd_EndOfSISSceneCleanup;7
End of Subinterval Scene Identification Cleanup



Determine Scene Centers

pcd_MainDetermineScenes;9 Determine Scene Centers





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IDPS Release 1 Accomplishments



- n Implemented IDP main program module
- n Implemented IDP band module
- n Generate L0R band files
- n Insert partial metadata into LPS database
- n Prototype MWD



- n **Automatic Cloud Cover Assessment**
 - Perform cloud cover assessment
 - Perform radiometric correction of data
 - Store results in LPS database
 - Will require approximately 90 megabytes of memory
- n **Browse file generation**
 - Perform radiometric correction on image data
 - Perform wavelet reduction of image
 - Apply contrast stretching to image
 - Perform JPEG compression of image
 - Store result as a RIS24 image in an HDF file



n **Moving Window Display**

- Create swath image composed of selected band data lines
- Display image as data is received by IDP
- Display image concurrently with band file generation
- Uses standard X Windows API
- Reduces image by pixel averaging



- n **Band module modifications**
 - Match DFCB band file format changes
 - Consolidate geolocation dimensions
 - Implement band 8 file segmentation
 - Send scan lines to MWD
 - Send band file information and end of contact messages to ACCA and Browse
 - Include partial scenes in band files
- n **Partial scenes**

IDPS Wavelet Reduction

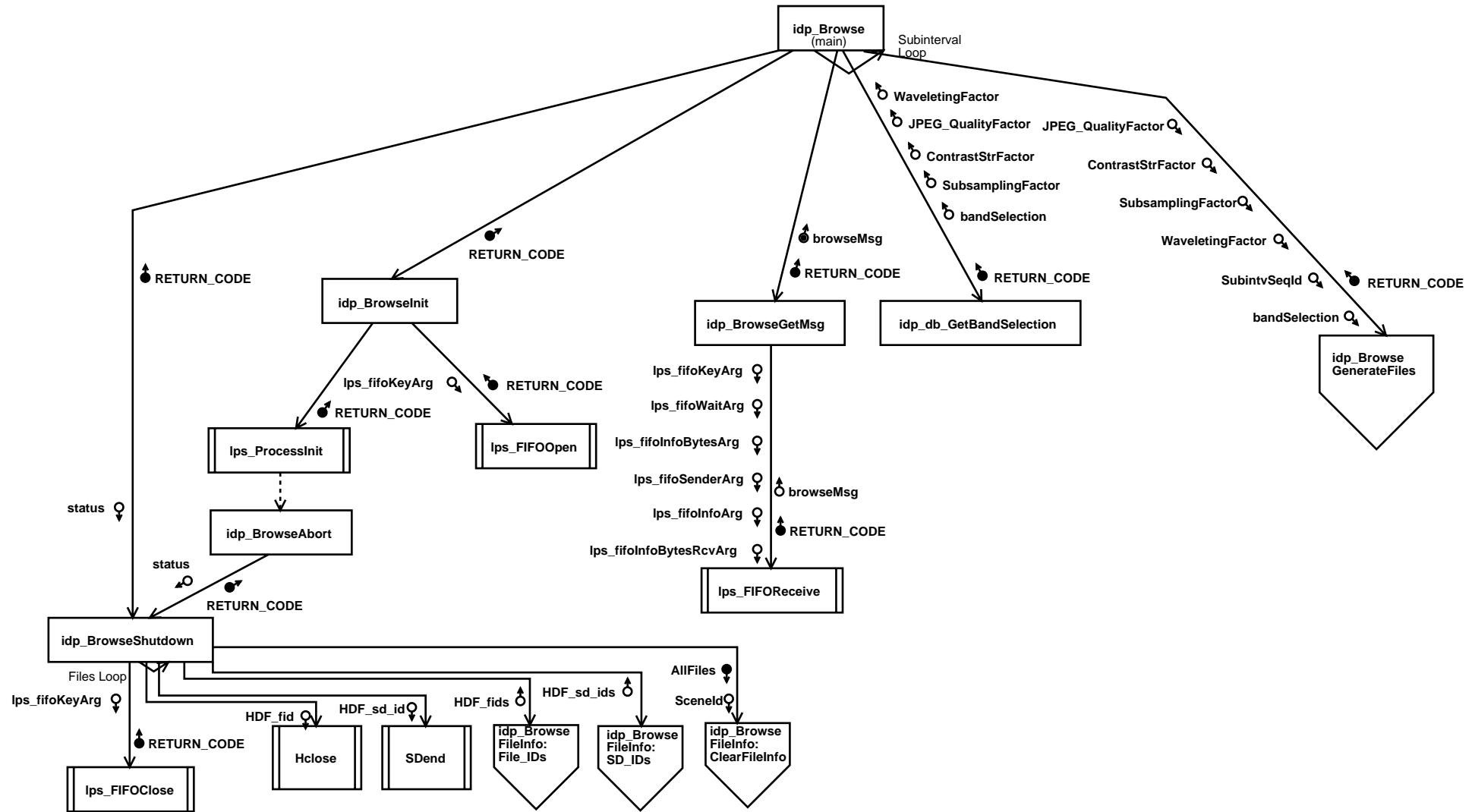


- n **wavelet_alg** function provided to LPS by Systems Engineering will be treated as COTS software
- n IDP developers will modify this function to use buffers instead of files for image input/output

Browse Files

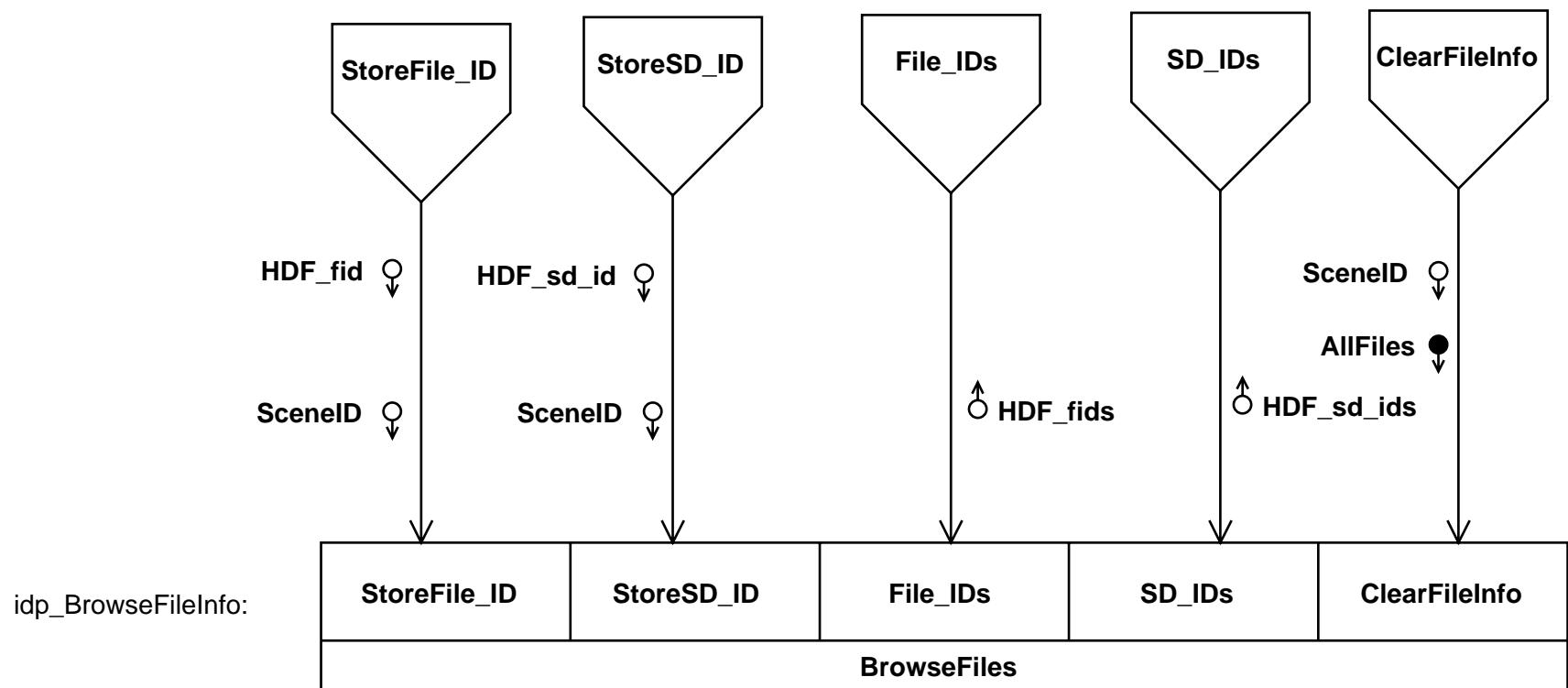
idp_Browse;9
Browse Files

04 Dec 1996

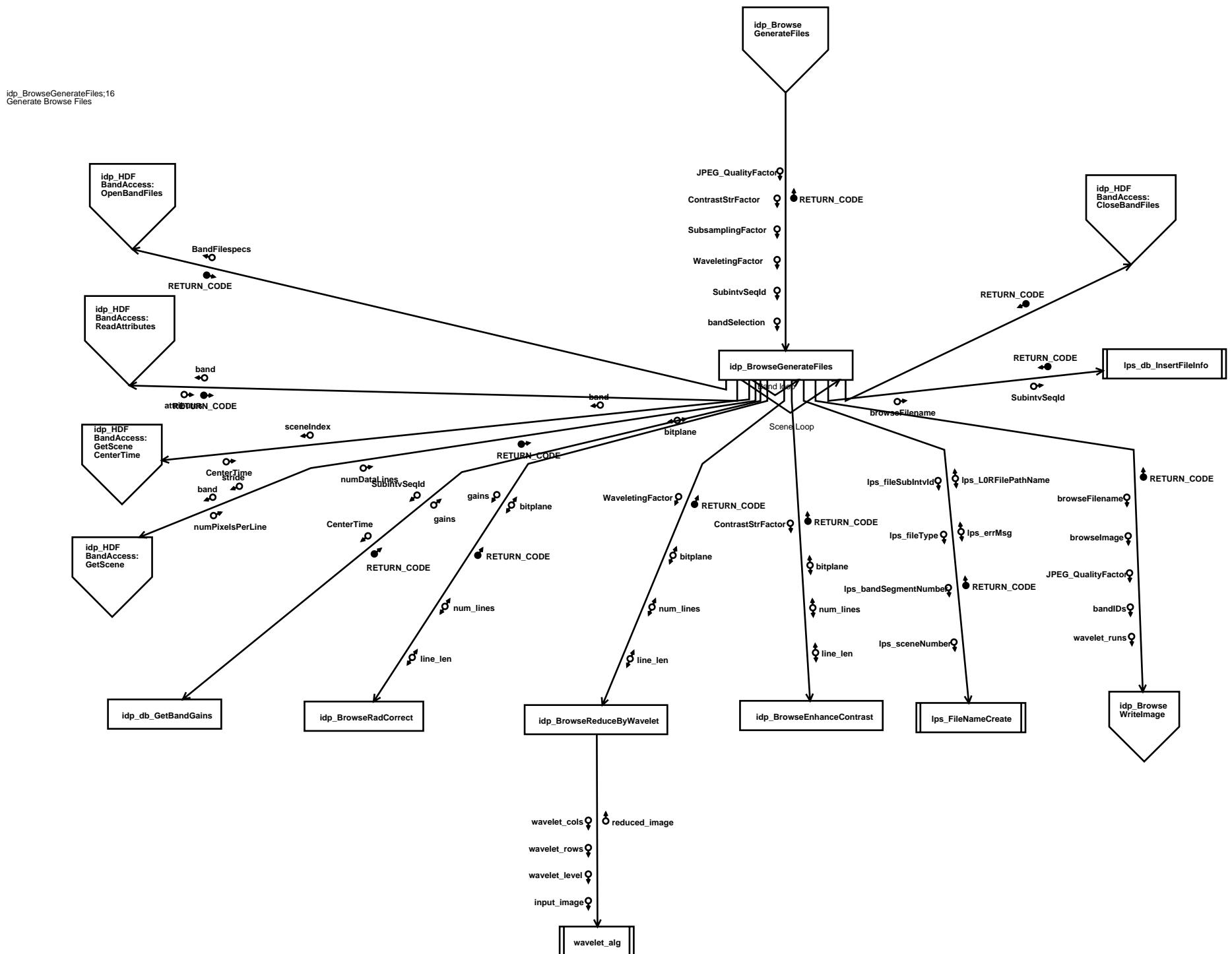


idp_BrowseFileInfo;3
Browse File Information

18 Nov 1996



Generate Browse Files



Write Browse Image

idp_BrowseWriteImage;8
Write Browse Image

19 Nov 1996

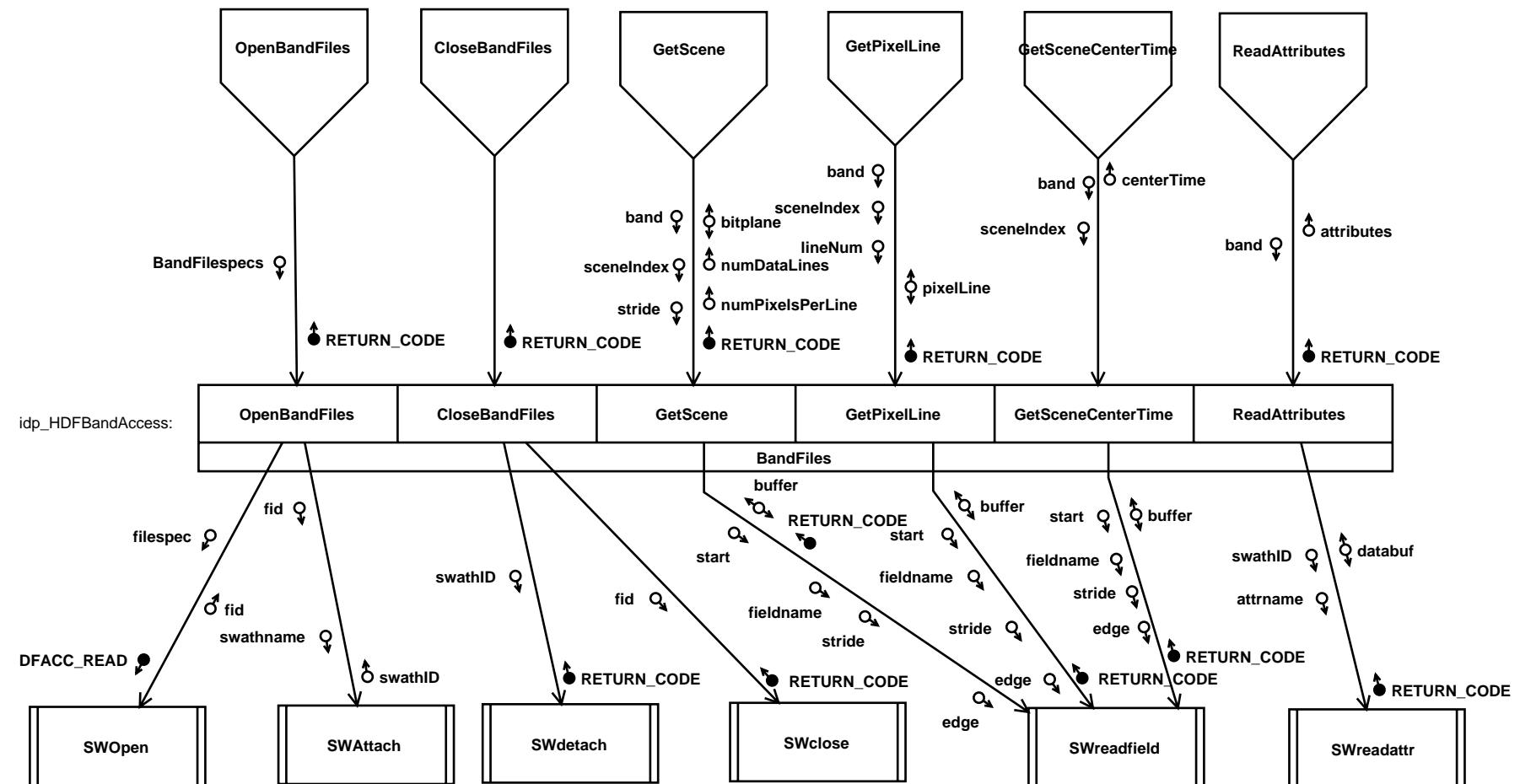
Called by idp_BrowseGenerateFiles



HDF Access Band Files

idp_HDFBandAccess;7
HDF Access Band Files

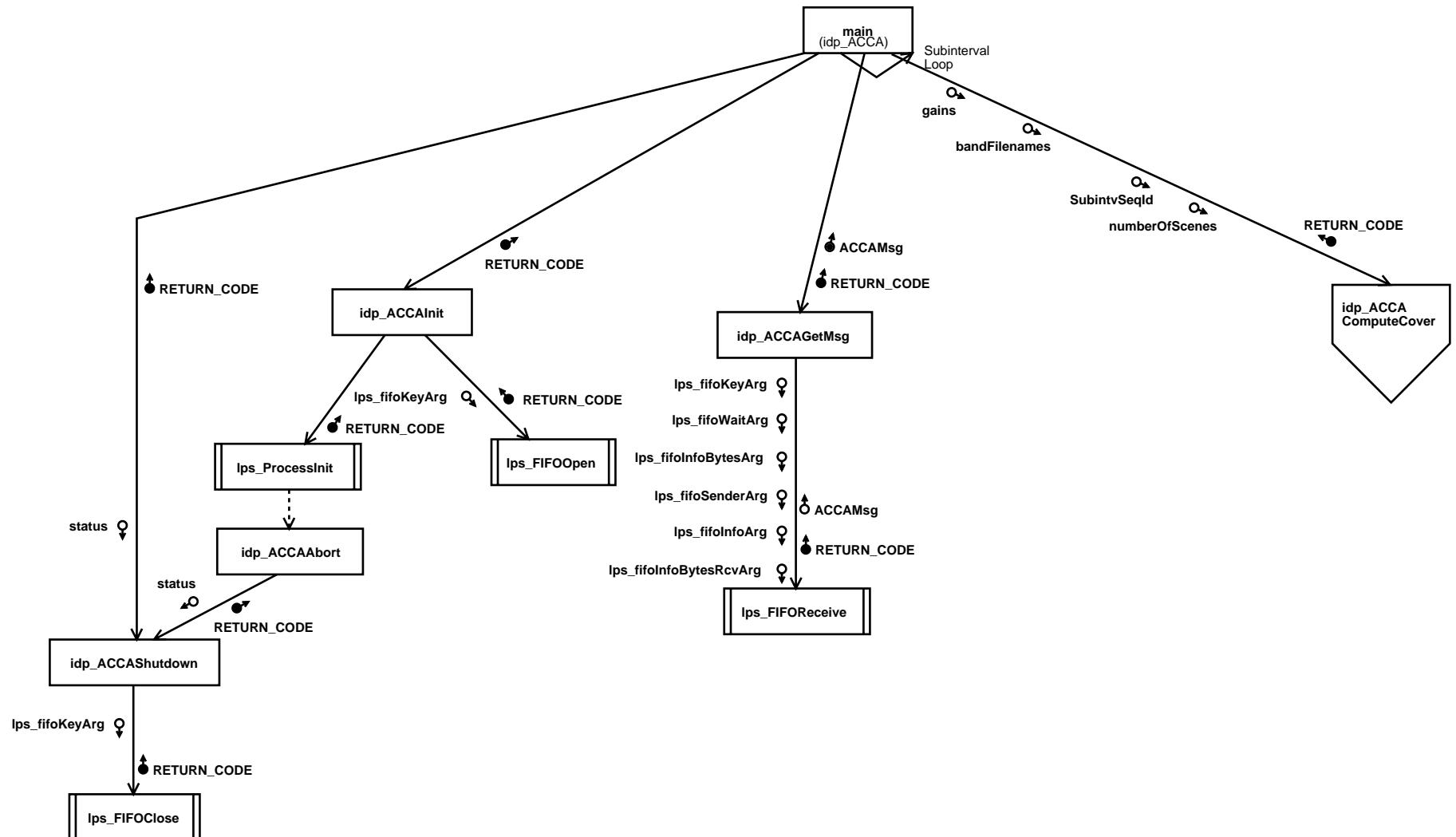
04 Dec 1996



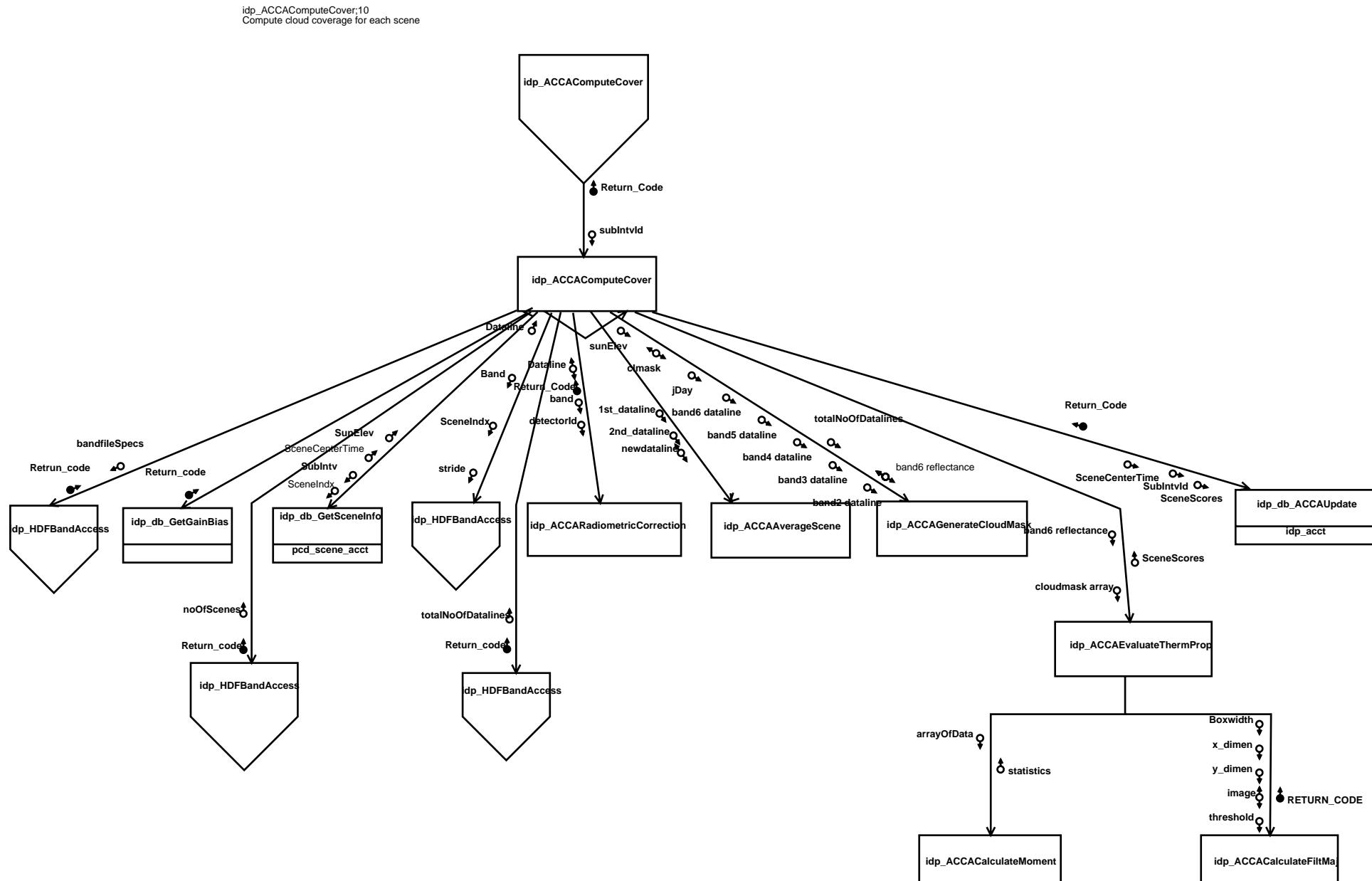
Automatic Cloud Cover Assessment

idp_ACCA;1
Automatic Cloud Cover Assessment

04 Nov 1996



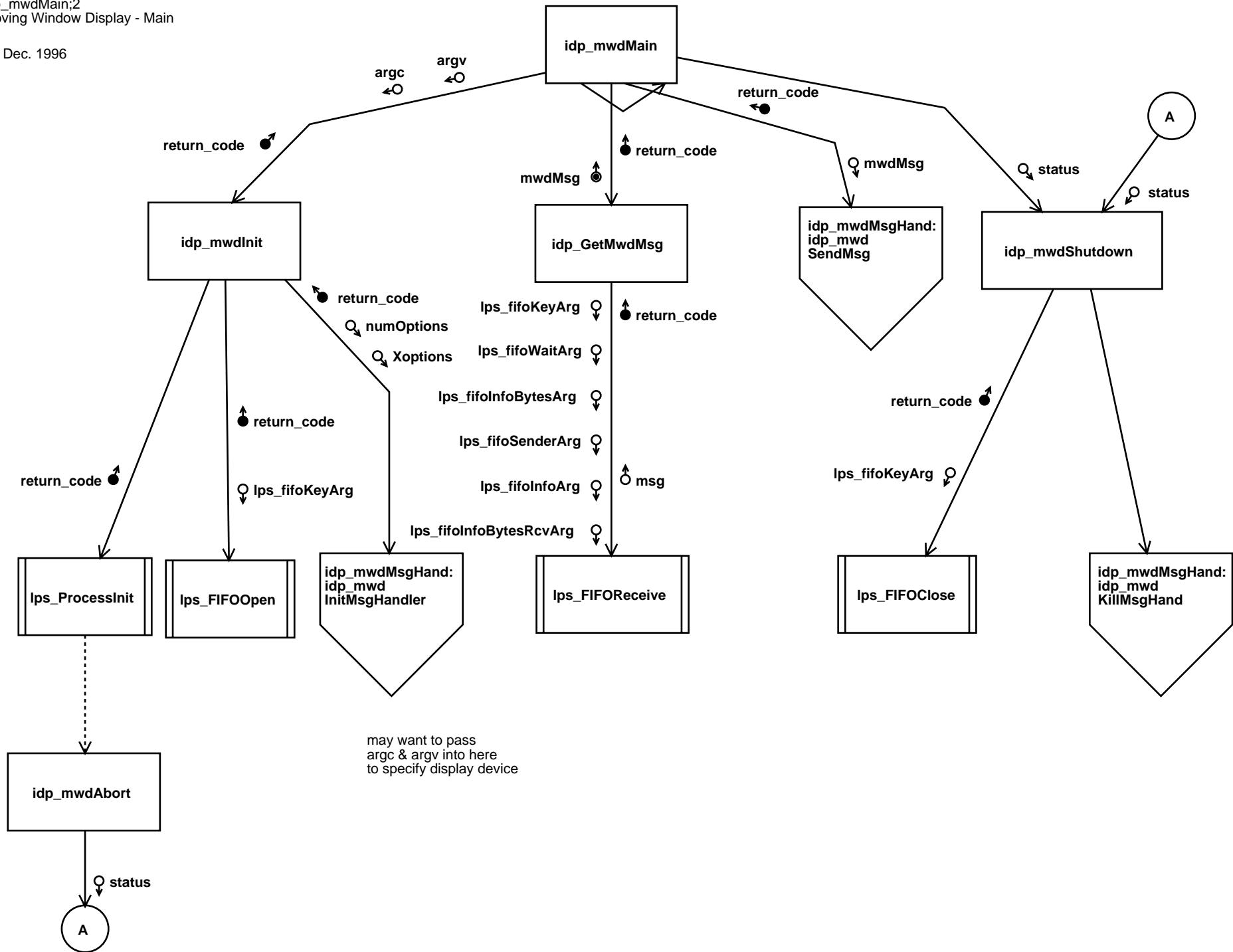
Compute cloud coverage for each scene



Moving Window Display - Main

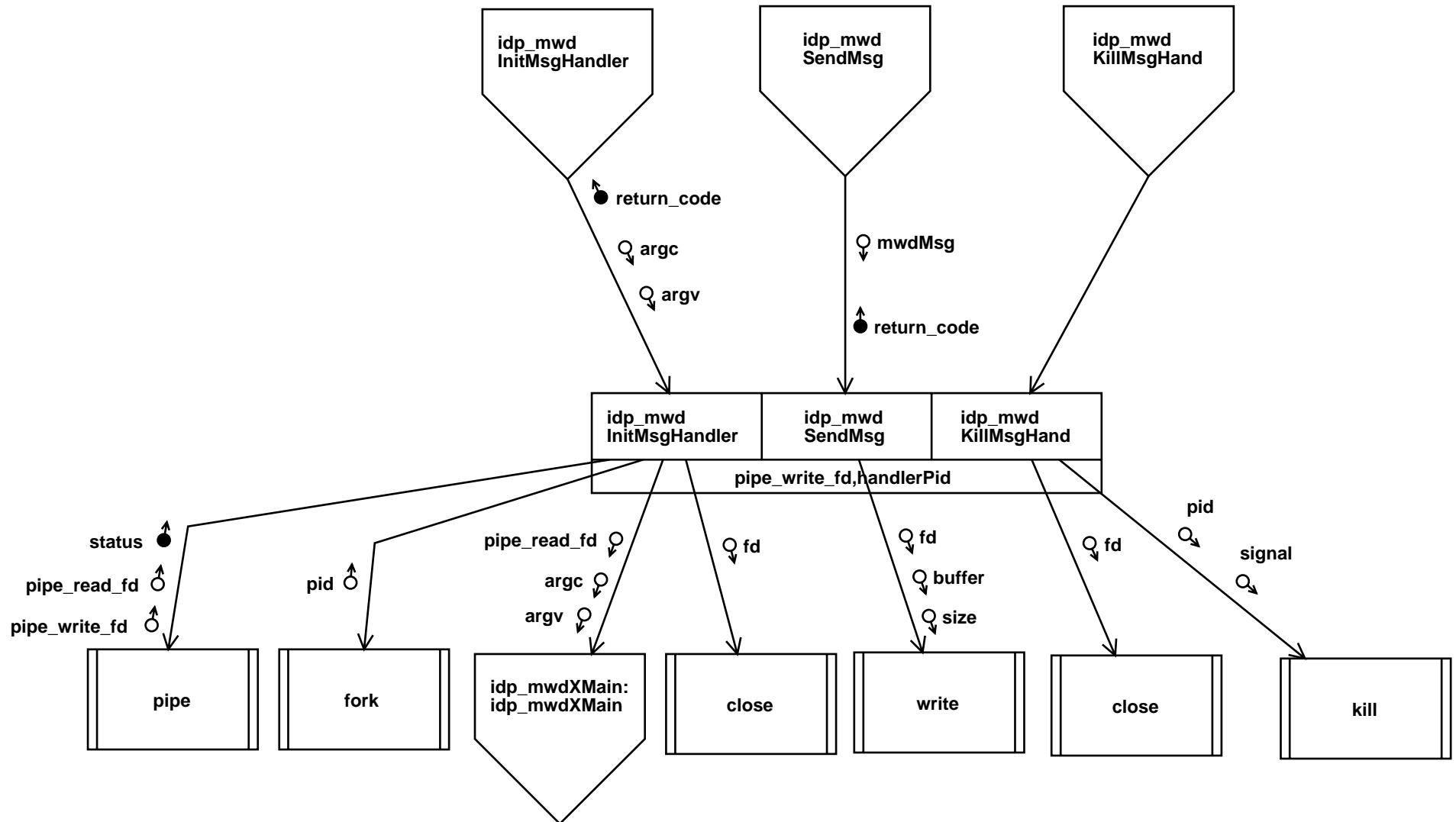
idp_mwdMain;2
Moving Window Display - Main

13 Dec. 1996

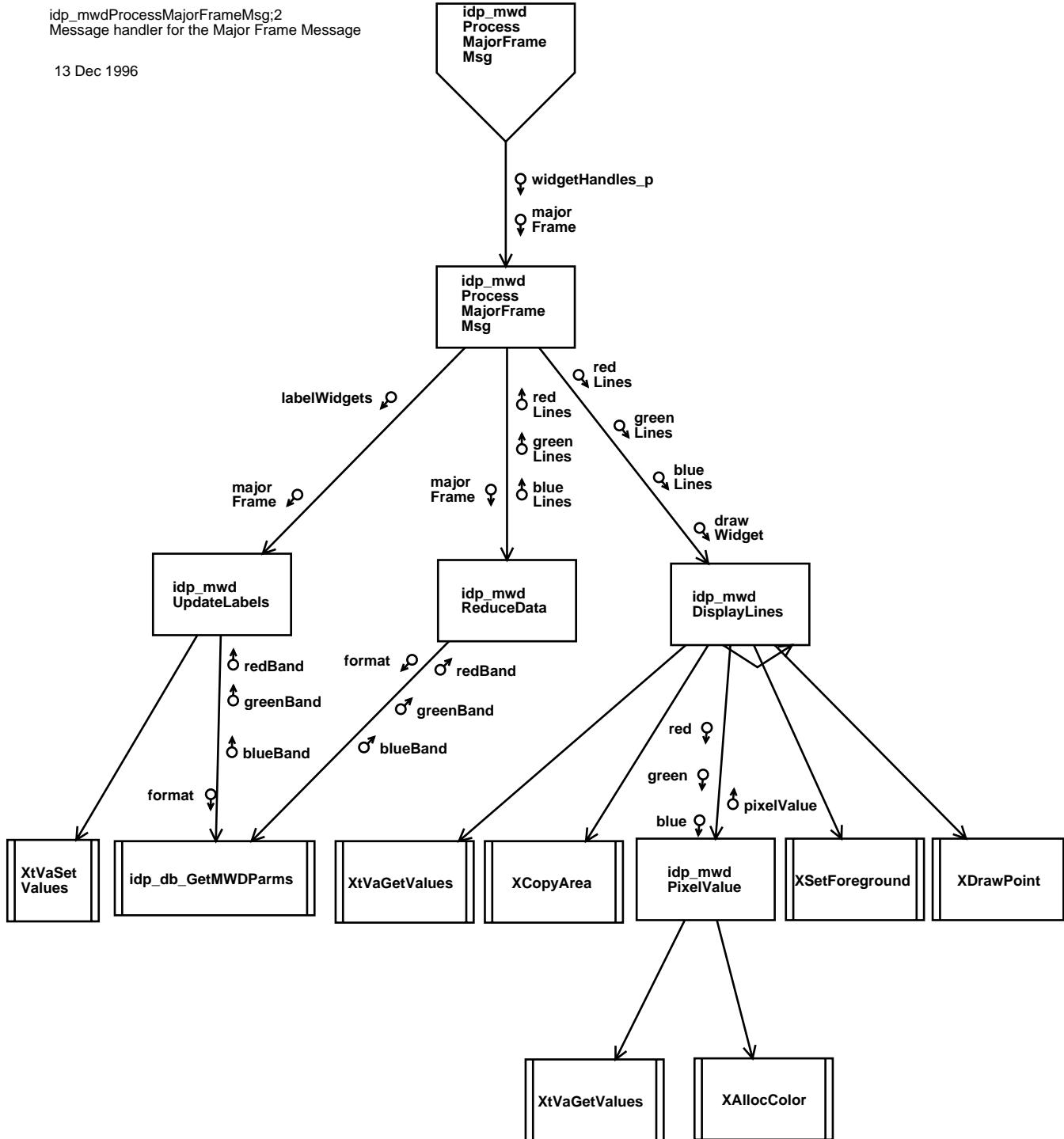


MWD message handler

idp_mwdMsgHand;1
MWD message handler

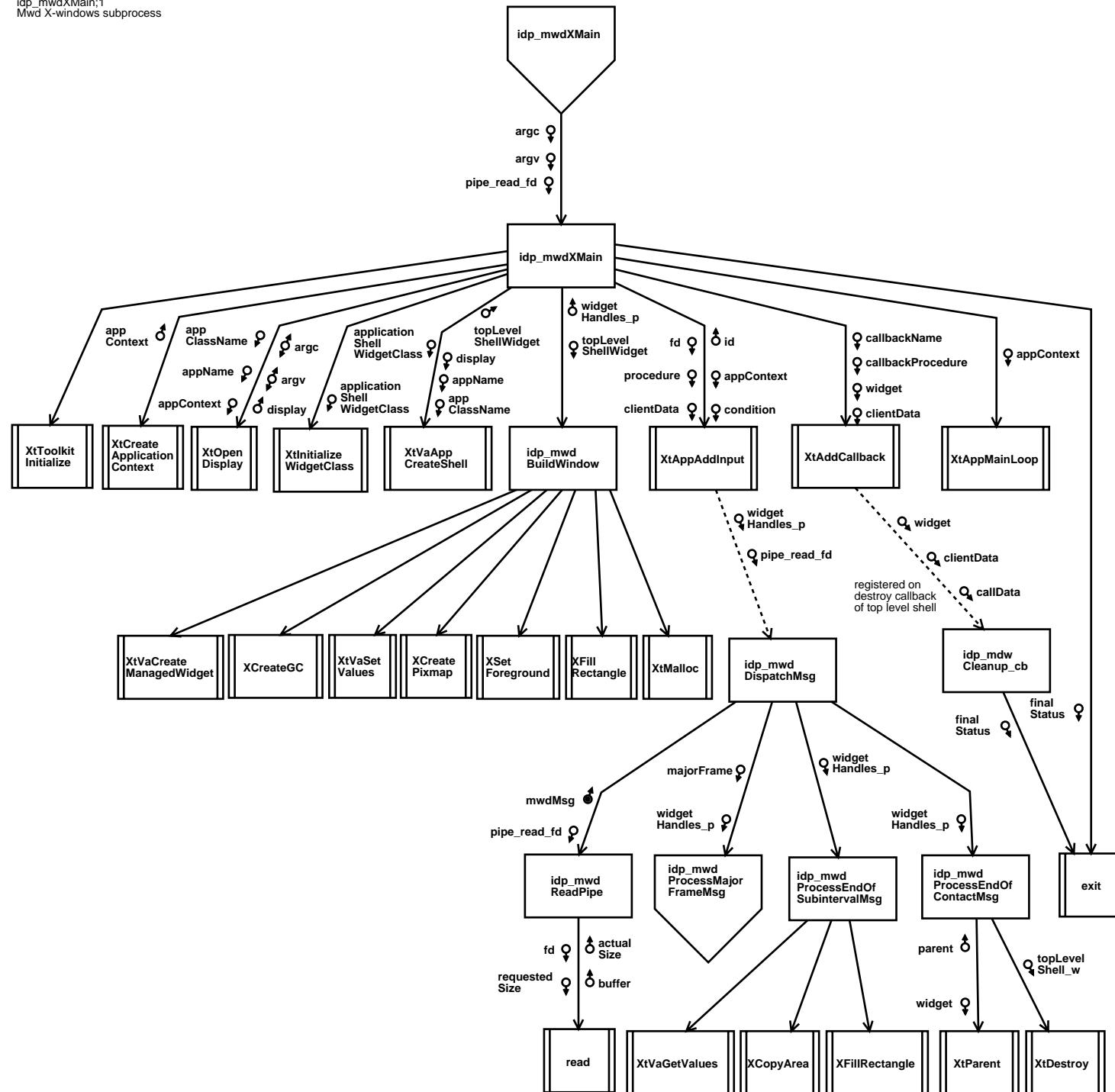


Message handler for the Major Frame Message



Mwd X-windows subprocess

idp_mwdXMain;1
Mwd X-windows subprocess





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LDTS Release 1 Accomplishments



- n Establish communication channel between LPS and ECS
- n Create DAN
- n Send DAN to ECS
- n Resend DAN to ECS
- n Receive and process DAA
- n Create DDN server to receive DDN and process DDN
- n Stop DDN server

***LDTs New Functionality for Build 3,
Release 2***



- n **Retain contact period L0R files (via UI)**
- n **Generate file transfer summary report (via UI)**
- n **Delete contact period L0R files**
- n **Resend suspended DANs**

LDTs Design Changes



- n Revise failover strategy for DDN processing
- n Prevent reprocessing DAN
- n Handle duplicate DDN

Revise Failover Strategy for DDN Processing



- n **Ensure that `ldt_RcvDDN` does not lose DDNs when the system crashes, when the operator shuts down the LPS software, or when the operator disables (and thus kills) the DDN server**
 - Checkpoint DDN processing milestone information in DDN server information database table
 - Send DDA after LDTs completes DDN processing
 - Check DDN server status before `stopddn` kills DDN server



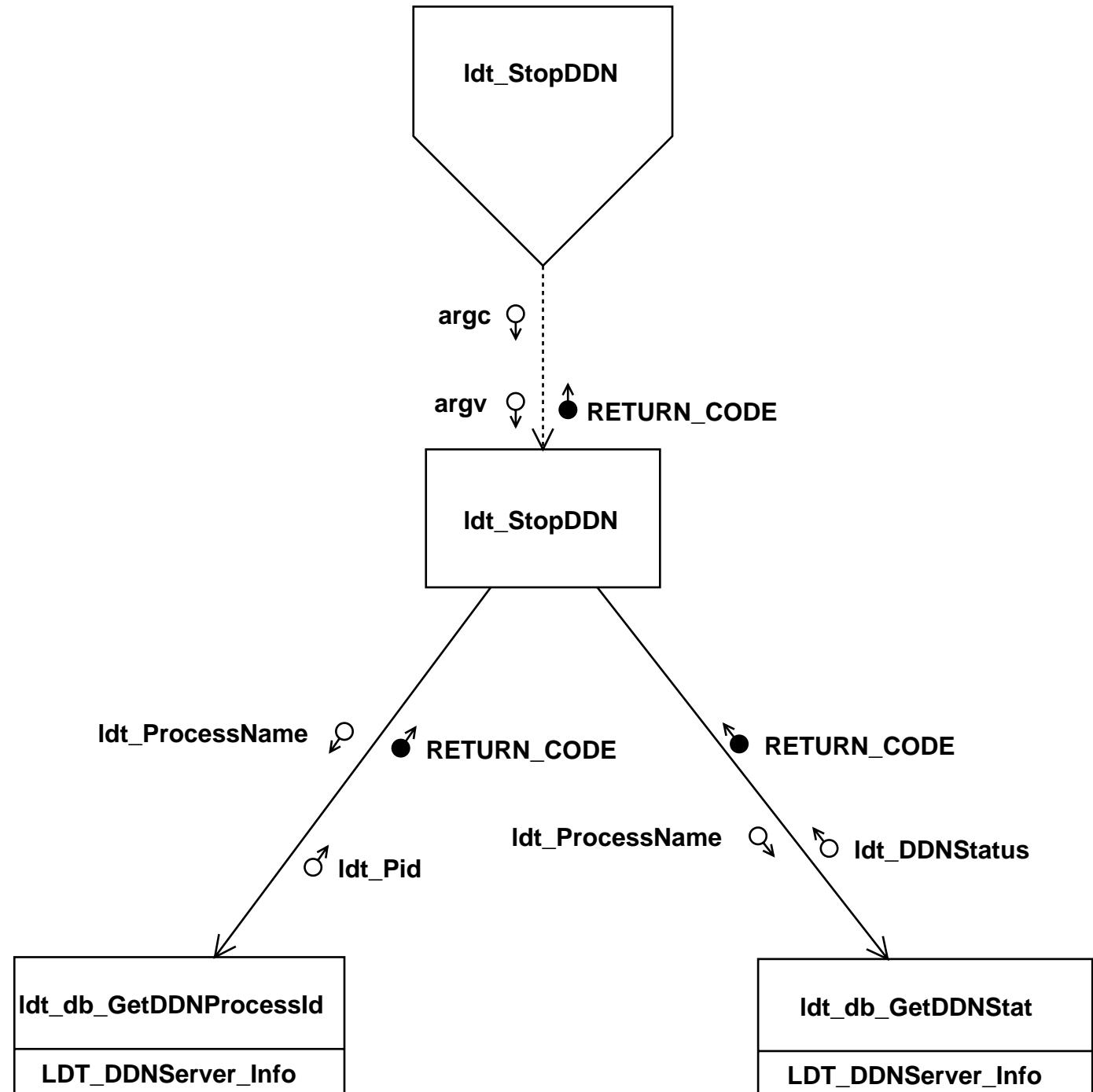
- n **Problem: Disabled DAN is reprocessed on a different string that sends the associated DAN**
 - Operations
 - Operator should manually update DAN_Status from “Suspended” into “Reprocessed_By_Other” in LDT_DAN_Info table on original string
 - LDTs
 - Added “Reprocessed_By_Other” status to DAN_Status field in LDT_DAN_Info table
 - Ignores DANs marked with “Reprocessed_By_Other” when ResendSuspendedDANs or ResendFailedDANs is invoked

Handle Duplicate DDNs

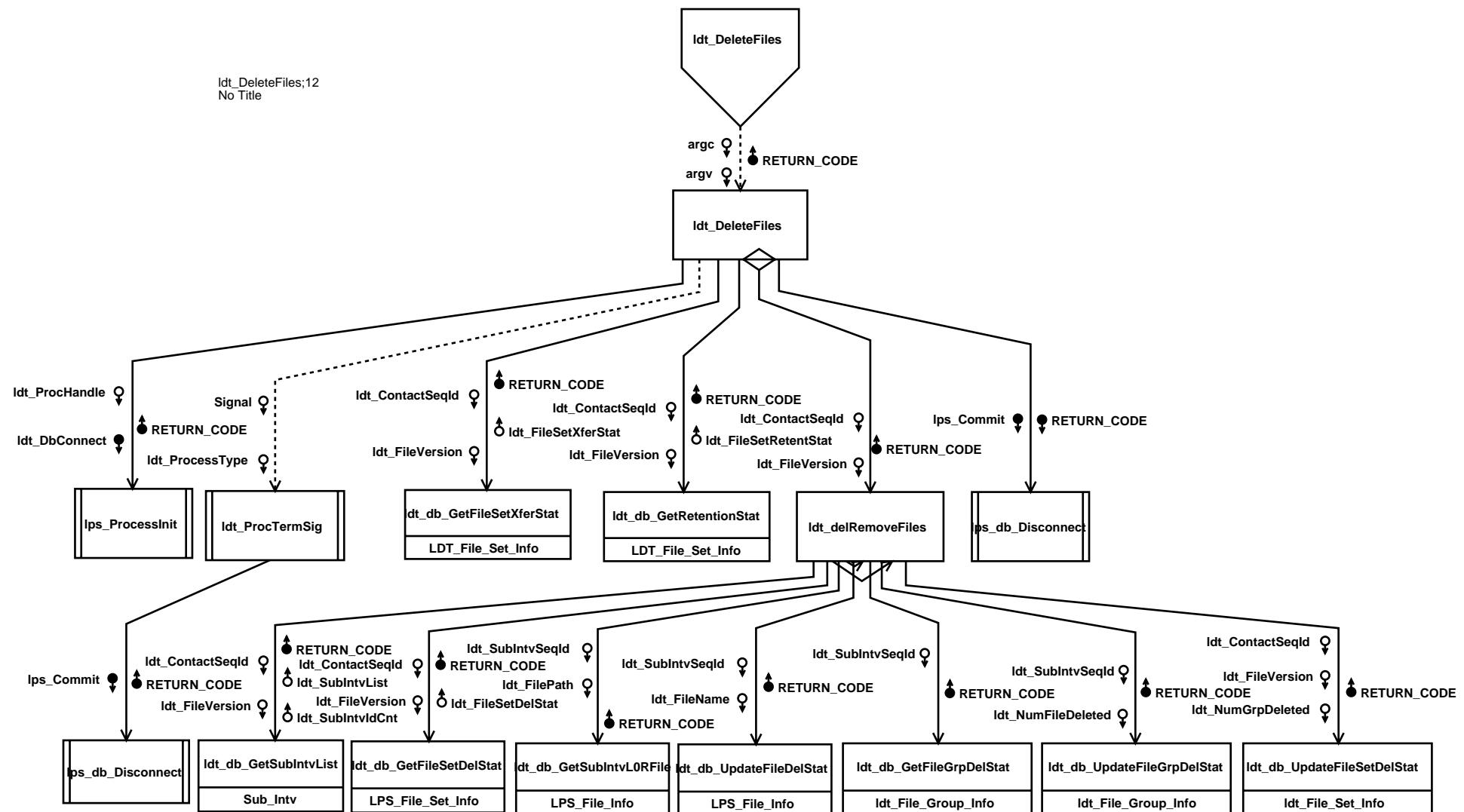


- n **Check DDN_Receive_Time_Stamp in LDT_DAN_Info table to determine whether received DDN is a duplicate**
- n **Resend DDA to ECS before discarding duplicate DDN**
- n **Verify DDN processing integrity before discarding duplicate DDN**

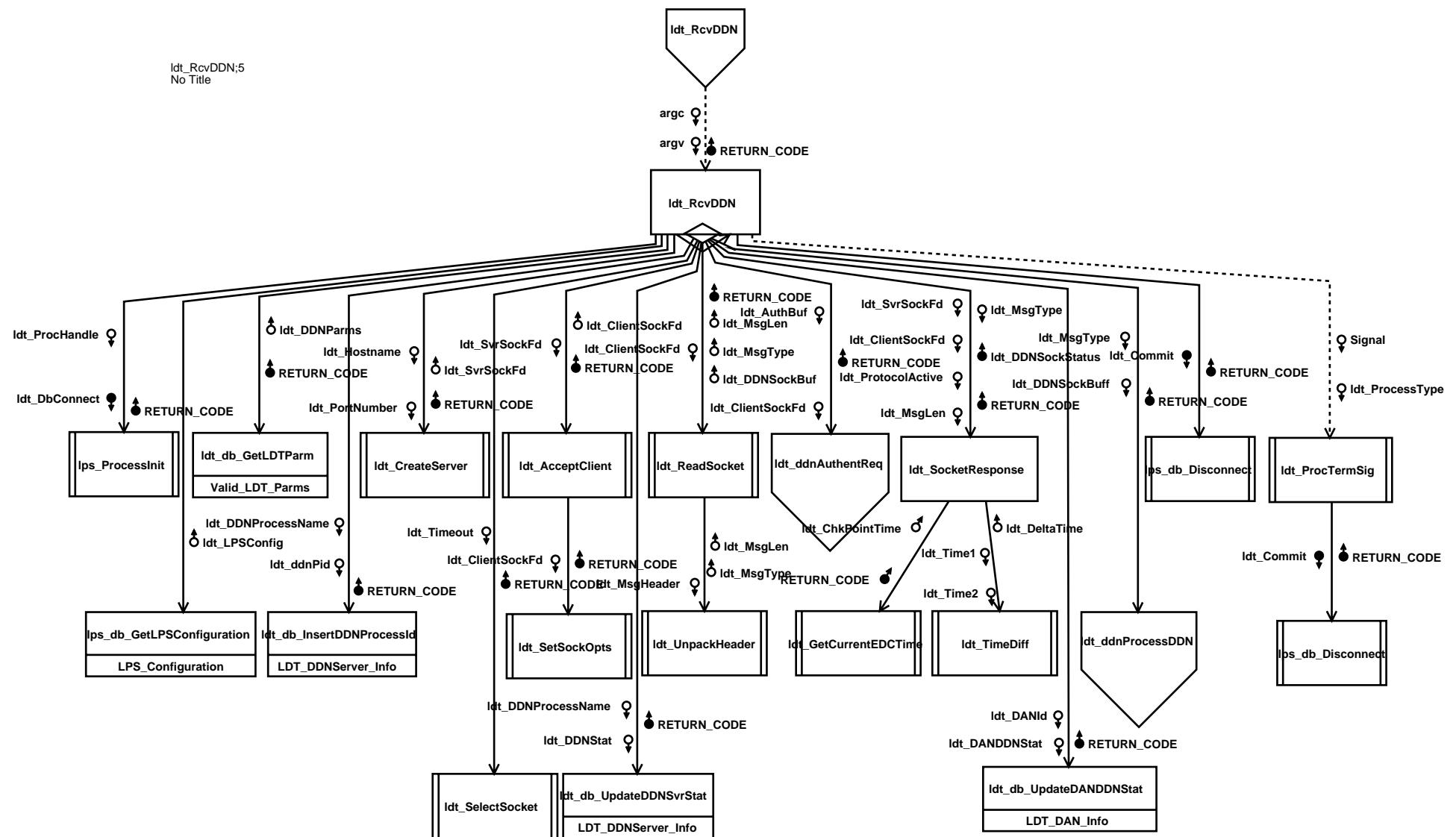
ldt_StopDDN;4
No Title



No Title

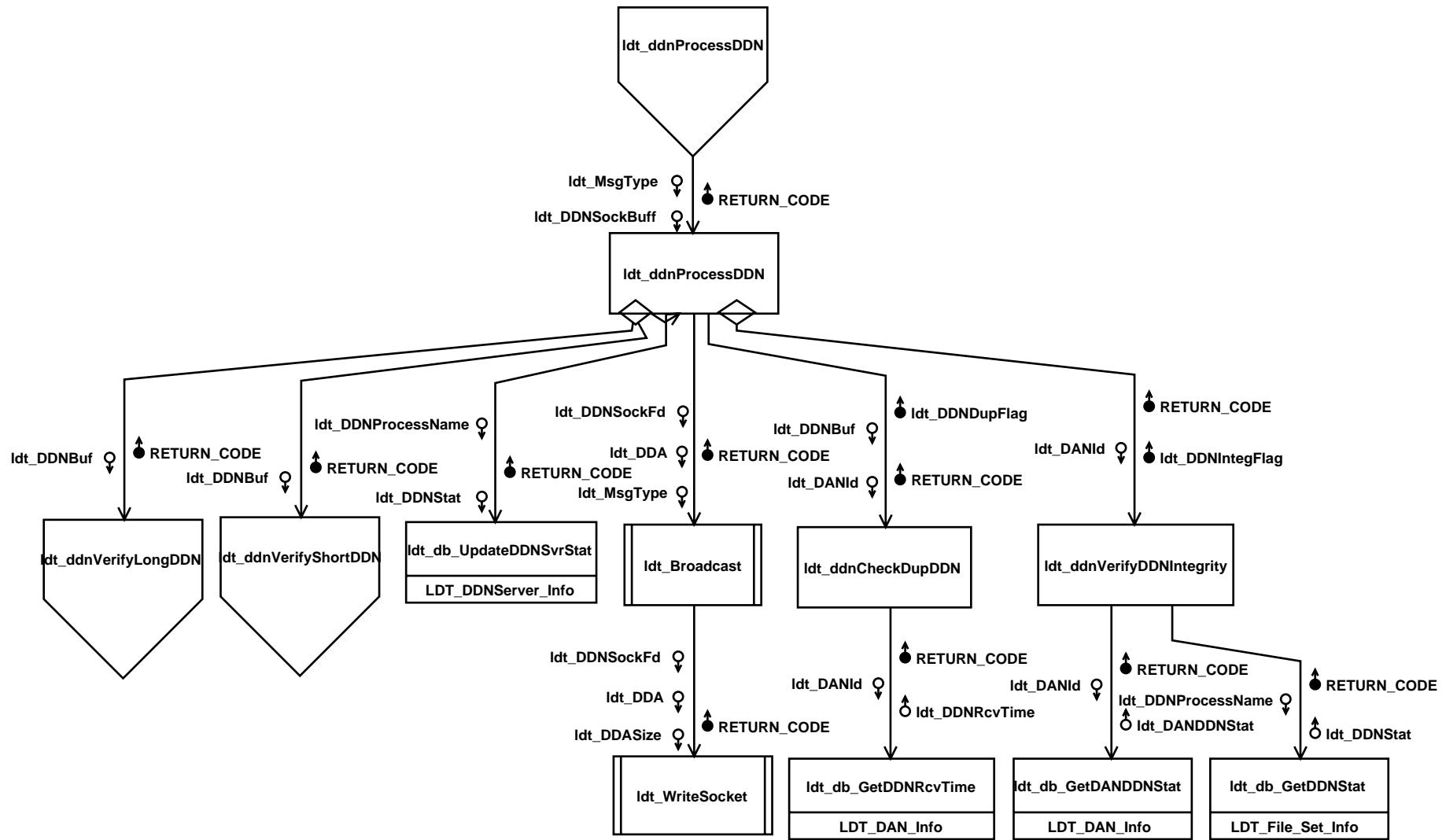


No Title

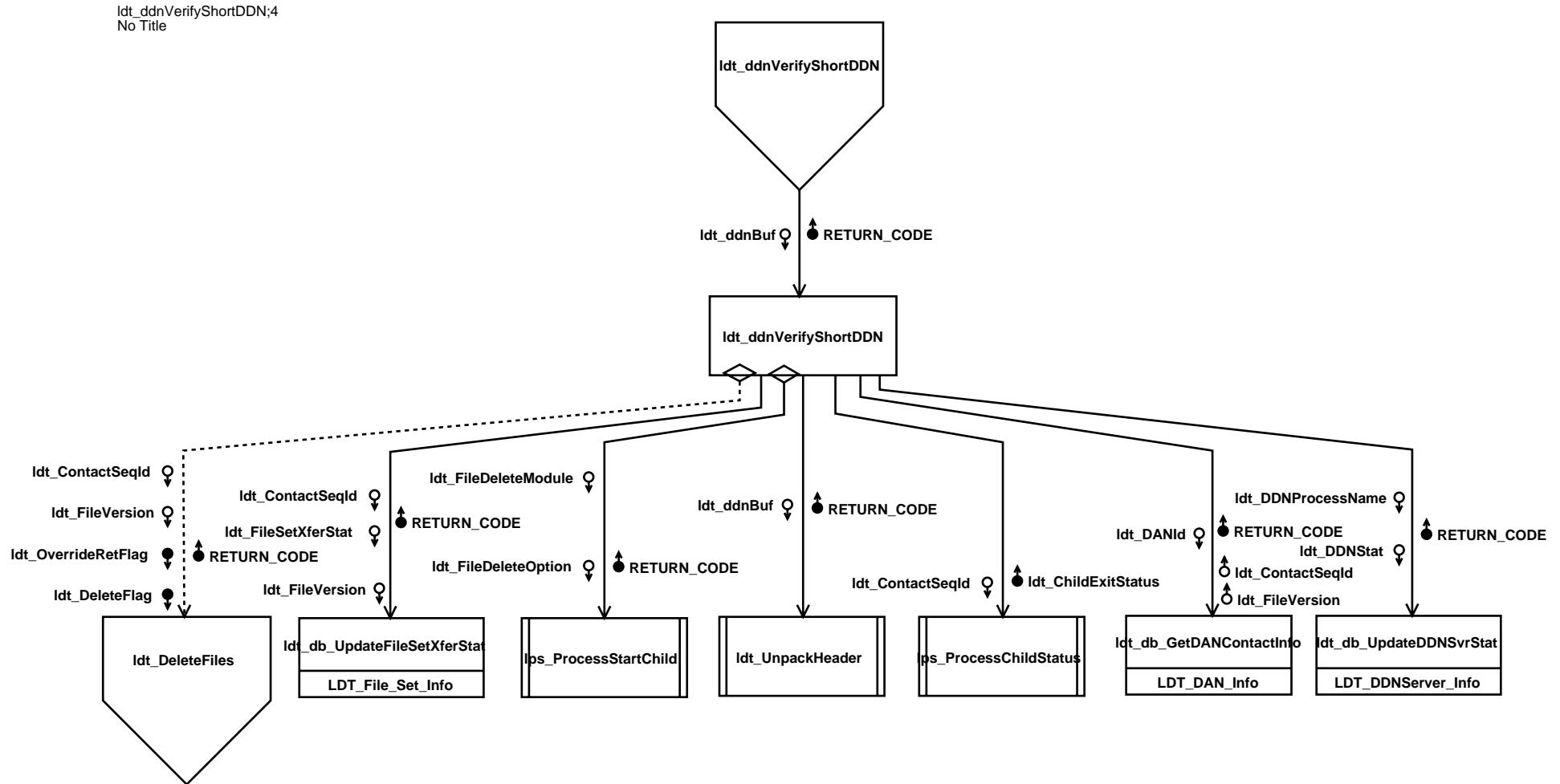


No Title

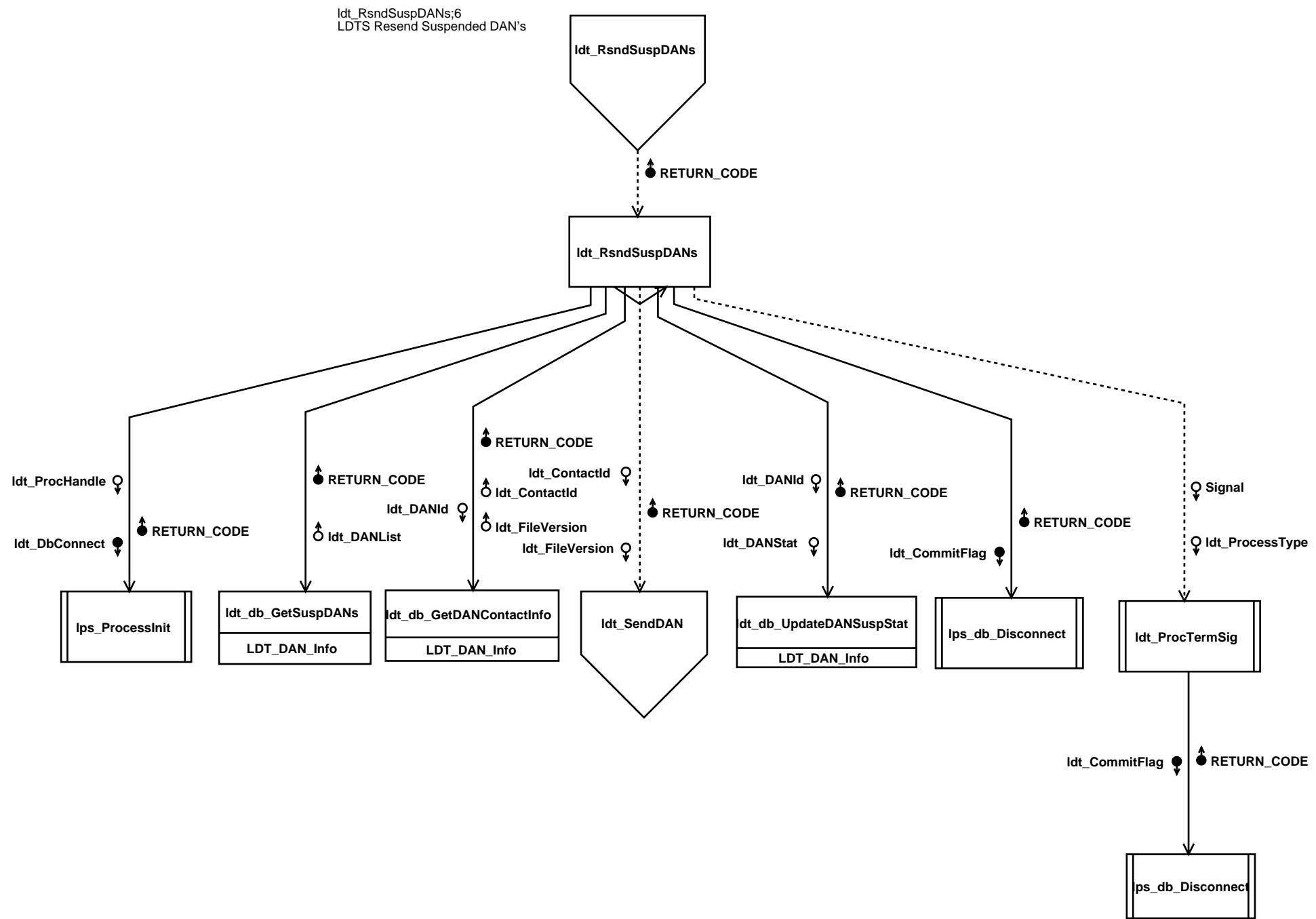
ldt_ddnProcessDDN;6
No Title



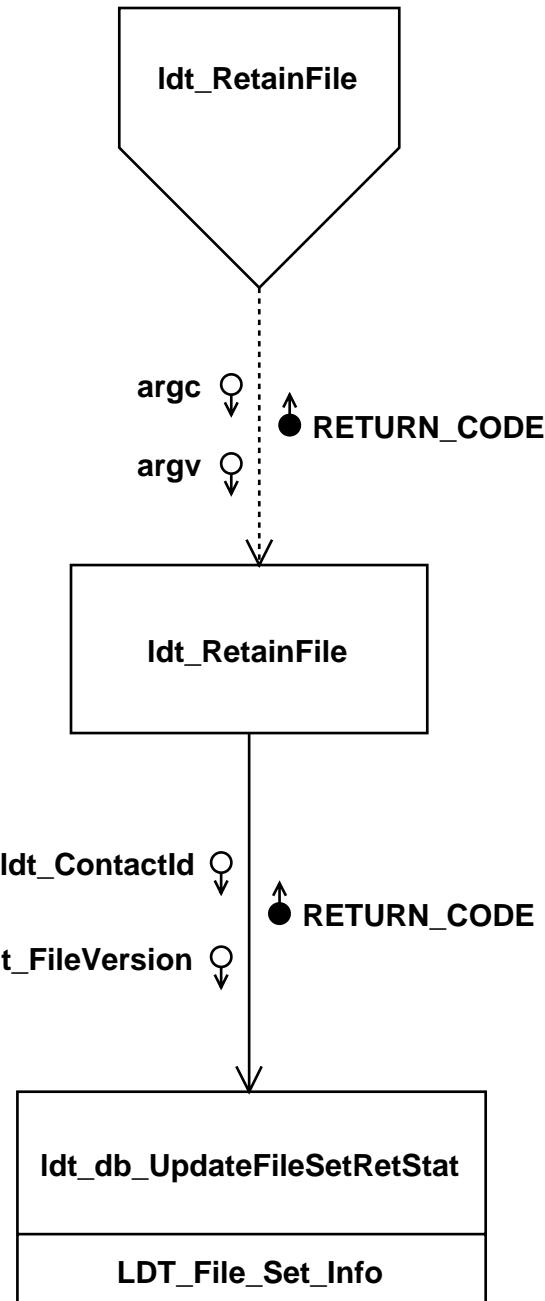
No Title



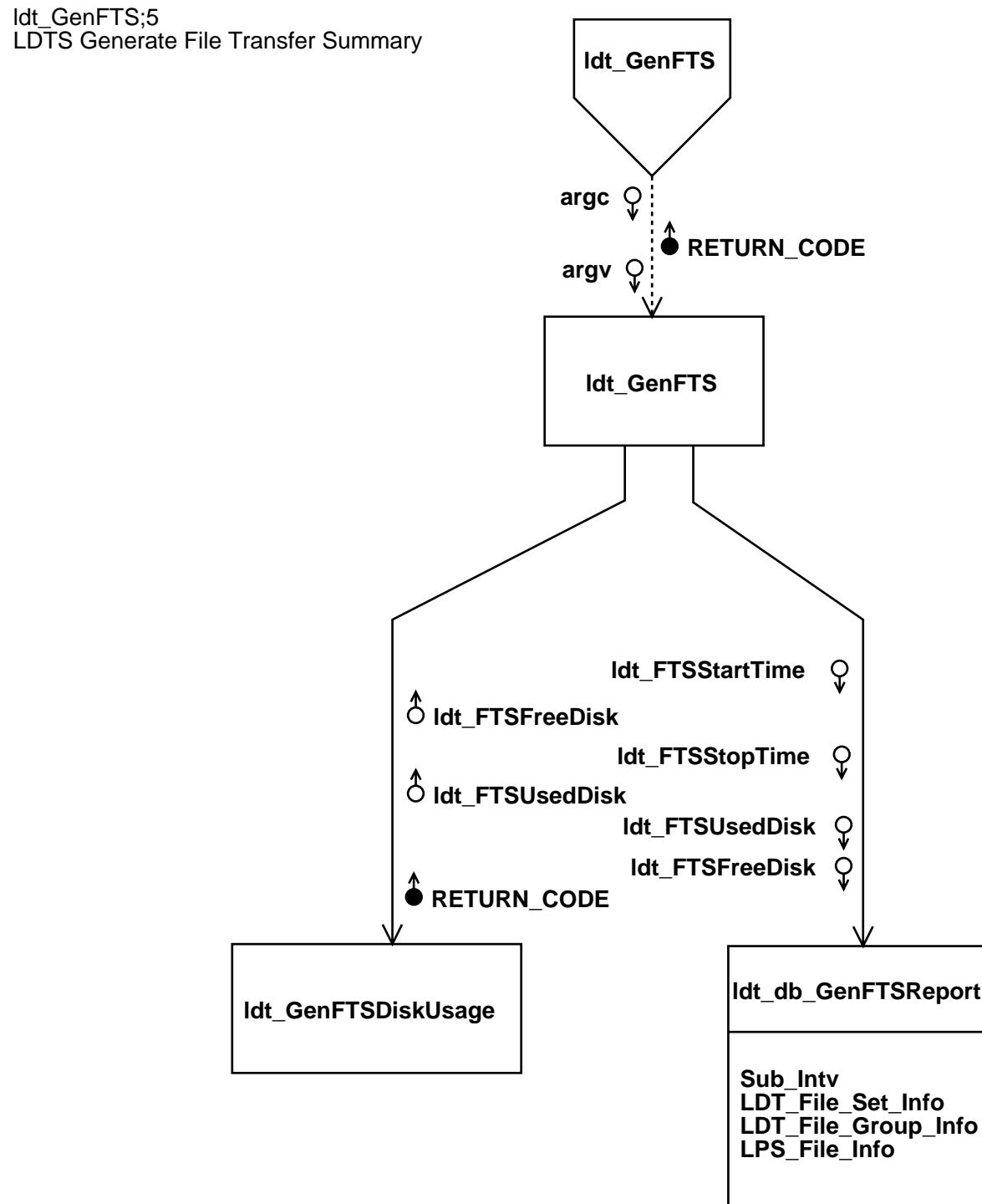
LDTs Resend Suspended DAN's



ldt_RetainFiles;1
No Title



LDTs Generate File Transfer Summary



Agenda



- n **Introduction – Nate Daniel**
- n **BRR Action Item Resolution – Nate Daniel**
- n **System-Level Issues – Dan Ferry**
- n **Subsystem Design Deltas – Subsystem Leads**
- n **Documentation Plans – Dan Ferry**
- n **Lessons Learned – Dan Ferry**
- n **Unit Status Database – Dan Ferry**
- n **Schedule – Nate Daniel**
- n **Action Items and Questions – Nate Daniel**



	<u>Final</u>
n System Users Guide (updated)	6/30/97
n Programmers Reference Manual (new)	7/21/97
n Software Configuration Guide (new)	6/23/97
n Software Requirements Specification (updates)	2/17/97
n As-Built Specification (updated Detailed Design Specification)	7/21/97

Agenda



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Lessons Learned



- n **Design and implementation**
- n **Software integration and test**
- n **Configuration management**
- n **Delivery process**



- n Revisit early design efforts
- n Minimize global variables
- n Spend more time on design and bench debugging
- n Choose a chief inspector who knows the material
- n Ensure everyone uses the same compiler flags (for example, -ansi)
- n Perform more extensive module testing
- n Verify subsystem interfaces before I&T



- n **Make integration a team effort**
- n **Check tools and scripts before they are needed**
- n **Provide I&T data for subsystem testing**
- n **Ensure no surprises in test data**

Configuration Management



- n Place ALL code (including tools) under configuration management from the beginning
- n Permit NO local versions of code
- n Add RCS \$Log\$ symbol to change histories
 - Add to all units (e.g., C, scripts, makefiles) and documents
 - Documents version number, perpetrator, and reason for change
- n Add a string constant to all source code to document the executable
 - For example:
`static const char idp_Main_c_version[] =
 "@(#)Id";`
 - UNIX “what” command shows this information

Delivery Process



- n Place delivery documents under configuration management
- n Make deliveries to I&T INFORMAL, but maintain traceability
- n Make FORMAL delivery to CM/ST at end of I&T

Agenda



- n **Introduction – Nate Daniel**
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	Build 3 New/ Changed	ICCRs (est 20% of Build 2 DS1)
Globals	80	280
MACS/DB	3000	670
RDCS	2200	—
RDPS	50	30 (1 ICCR)
MFPS	645	813
PCDS	1730	1211
IDPS	4200	428
LDTS	1400	640
Total	13,305	4072

Dec 11 1996 08:26

bdr_status.report

Page 1

LPS Build 3 Unit Status

UNIT	SUB	DESIGN	DESIGN	CODE	CODE	UNIT	UNIT	PGMR	DSGN
		SYS	INSPECT	CERT	INSPECT	CERT	TEST		
PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL	PLANNED	ACTUAL		
idp_ACCAAssessScene.c	IDP	11/22/96		02/10/97				IW	IW
idp_ACCACalculateMoment.c		11/22/96		02/10/97				IW	IW
idp_ACCACaluculateFiltMaj.c		11/22/96		02/10/97				IW	IW
idp_ACCAComputeCover.c		11/22/96		02/10/97				IW	IW
idp_Browse.c		11/21/96		02/03/97				RT	MR
idp_BrowseAbort.c		11/21/96		02/03/97				RT	MR
idp_BrowseEnhanceContrast.c		11/21/96		02/03/97				RT	MR
idp_BrowseFileInfo.c		11/21/96		02/03/97				EL	MR
idp_BrowseGenerateFiles.c		11/21/96		02/03/97				RT	MR
idp_BrowseGetMsg.c		11/21/96		02/03/97				RT	MR
idp_BrowseInit.c		11/21/96		02/03/97				RT	MR
idp_BrowseRadCorrect.c		11/21/96		02/03/97				RT	MR
idp_BrowseReduceByWavelet.c		11/21/96		02/03/97				EL	MR
idp_BrowseShutdown.c		11/21/96		02/03/97				RT	MR
idp_BrowseWriteImage.c		11/21/96		02/03/97				EL	MR
idp_GetMwdMsg.c		11/19/96		02/12/97				RT	MR
idp_HDFBandAccess.c		11/21/96		02/03/97				RT	MR
idp_db_ACCAUpdate.pc		11/22/96		02/10/97				IW	IW
idp_db_GetBandColorMap.pc		11/21/96		02/03/97				RT	MR
idp_db_GetBandSelection.pc		11/21/96		02/03/97				RT	MR
idp_db_GetSceneInfo.pc		11/22/96		02/10/97				IW	IW
idp_mwdAbort.c		11/19/96		02/12/97				MR	EC
idp_mwdBuildWindow.c		11/19/96		02/12/97				MR	EC
idp_mwdCleanup_cb.c		11/19/96		02/12/97				MR	EC
idp_mwdDispatchMsg.c		11/19/96		02/12/97				MR	EC
idp_mwdDisplayLines.c		11/19/96		02/12/97				MR	EC
idp_mwdInit.c		11/19/96		02/12/97				MR	EC
idp_mwdInitMsgHandler.c		11/19/96		02/12/97				MR	EC
idp_mwdKillMsgHand.c		11/19/96		02/12/97				MR	EC
idp_mwdMain.c		11/19/96		02/12/97				MR	EC
idp_mwdMsgHand.c		11/19/96		02/12/97				MR	EC
idp_mwdPixelValue.c		11/19/96		02/12/97				MR	EC
idp_mwdProcessEndOfContactMsg.c		11/19/96		02/12/97				MR	EC
idp_mwdProcessEndOfSubintervalMsg.c		11/19/96		02/12/97				MR	EC
idp_mwdProcessMajorFrameMsg.c		11/19/96		02/12/97				MR	EC
idp_mwdReadPipe.c		11/19/96		02/12/97				MR	EC
idp_mwdReduceData.c		11/19/96		02/12/97				MR	EC
idp_mwdSendMsg.c		11/19/96		02/12/97				MR	EC
idp_mwdShutdown.c		11/19/96		02/12/97				MR	EC
idp_mwdUpdateLabels.c		11/19/96		02/12/97				MR	EC
idp_mwdXMain.c		11/19/96		02/12/97				MR	EC

ldt_DeleteFiles

LDT 12/31/96

01/24/97

SH SH

Dec 11 1996 08:26	bdr_status.report			Page 2	
ldt_GenFTS	01/31/97	02/14/97	HK	CL	
ldt_GenftsDiskUsage	01/31/97	02/14/97	HK	CL	
ldt_GenftsReport	01/31/97	02/14/97	HK	CL	
ldt_ProcTermSig	12/13/96	12/27/96	SH	SH	
ldt_RcvDDN	12/13/96	12/27/96	SH	SH	
ldt_RsndSuspDANs	12/20/96	01/17/97	CL	CL	
ldt_SendDAN	12/20/96	01/17/97	CL	CL	
ldt_StopDDN	12/13/96	12/27/96	SH	SH	
ldt_db_GetDANDDNStat	12/13/96	12/27/96	SH	SH	
ldt_db_GetDDNRcvTime	12/31/96	01/24/97	SH	SH	
ldt_db_GetDDNStat	12/13/96	12/27/96	SH	SH	
ldt_db_GetFileGrpDelStat	12/31/96	01/24/97	SH	SH	
ldt_db_GetFileSetDelStat	12/31/96	01/24/97	SH	SH	
ldt_db_GetFileSetInfo	12/13/96	12/27/96	SH	SH	
ldt_db_GetFileSetXferStat	12/13/96	12/27/96	SH	SH	
ldt_db_GetRetentionStat	12/31/96	01/24/97	SH	SH	
ldt_db_GetSuspDANS	12/20/96	01/17/97	CL	CL	
ldt_db_InsertFileSetInfo	12/20/96	01/17/97	CL	CL	
ldt_db_UpdatedANDDNStat	12/31/96	01/24/97	SH	SH	
ldt_db_UpdatedDANSuspStat	12/20/96	01/17/97	CL	CL	
ldt_db_UpdatedDDNSvrStat	12/13/96	12/27/96	SH	SH	
ldt_db_UpdateFileDelStat	12/31/96	01/24/97	SH	SH	
ldt_db_UpdateFileGrpDelStat	12/31/96	01/24/97	SH	SH	
ldt_db_UpdateFileSetDelStat	12/31/96	01/24/97	SH	SH	
ldt_db_UpdateFileSetRetStat	12/23/96	12/27/96	HK	HK	
ldt_ddnCheckDupDDN	12/13/96	12/27/96	SH	SH	
ldt_ddnProcessDDN	12/13/96	12/27/96	SH	SH	
ldt_ddnVerifyDDNIntegrity	12/13/96	12/27/96	SH	SH	
ldt_ddnVerifyShortDDN	12/13/96	12/27/96	SH	SH	
ldt_delRemoveFiles	12/31/96	01/24/97	SH	SH	
lps_ParseOptions.c	LPS	01/10/97	01/17/97	VT	VT
lps_TimeScanSecond.c		12/16/96	01/03/97	VT	VT
mac_ACAcceptSignal.c	MAC	01/31/97	02/07/97	MD	DC
mac_ACSleep.c		01/31/97	02/07/97	MD	DC
mac_AutoArchive.c	01/10/97	01/31/97	02/07/97	MD	MD
mac_AutoCapture.c	01/10/97	01/31/97	02/07/97	MD	MD
mac_AutoStartL0R.c	01/10/97	01/31/97	02/07/97	MD	MD
mac_DelSmallSubIntv.c	02/17/97	02/19/97	02/21/97	XJ	XJ
mac_IngestContact.c		02/07/97	02/14/97	MW	MW
mac_LoadIASParams.c		01/10/97	02/14/97	HK	HK
mac_PropL0RParams.c		02/07/97	02/14/97	HK	HK
mac_PurgeDatabase	02/17/97	02/19/97	02/17/97	HK	HK
mac_TestConfig	12/27/96	01/03/97	02/14/97	XJ	XJ
mac_db_ACGetNextCaptureInfo.pc		02/05/97	02/07/97	XJ	DC
mac_db_ACRegisterCapture.pc		02/05/97	02/07/97	XJ	DC
mac_db_CheckDiskSpace.pc	01/10/97	02/05/97	02/07/97	XJ	MD
mac_db_GetRDCAcctInfo.pc	01/10/97	02/05/97	02/07/97	XJ	MD

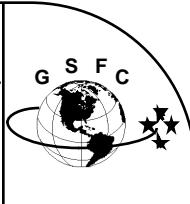
Dec 11 1996 08:26	bdr_status.report			Page 3		
mac_db_IngestContact.pc	02/07/97	02/14/97	MW	MW		
mac_db_LoadIASParams.pc	01/10/97	02/14/97	HK	HK		
mac_db_PropL0RParams.pc	02/07/97	02/14/97	HK	HK		
mac_ui_auto_capture.fmb	01/10/97	02/14/97	MW	MW		
mac_ui_data_rec_sum_rpt	01/31/97	02/14/97	MW	MW		
mac_ui_data_trans_sum_rpt	01/31/97	02/14/97	AH	AH		
mac_ui_delete_outfile.fmb	01/03/97	02/14/97	MW	MW		
mac_ui_delete_outfile_conf.fmb	01/03/97	02/14/97	MW	MW		
mac_ui_delete_rawfile.fmb	12/27/96	01/17/97	XJ	HK		
mac_ui_delete_rawfile_conf.fmb	12/27/96	01/17/97	XJ	HK		
mac_ui_edit_capt_src.fmb	01/15/97	01/17/97	MW	MW		
mac_ui_edit_cont_sched.fmb	01/15/97	01/17/97	MW	MW		
mac_ui_edit_l0r_params.fmb		01/17/97	HK	HK		
mac_ui_edit_l0r_thres.fmb		01/17/97	HK	HK		
mac_ui_edit_oftc.fmb		01/03/97	XJ	XJ		
mac_ui_gen_tape_label.fmb	12/27/96	01/03/97	XJ	XJ		
mac_ui_ingest_cont_sched.fmb		02/07/97	MW	MW		
mac_ui_load_ias_conf.fmb		01/10/97	HK	HK		
mac_ui_load_ias_params.fmb		01/10/97	HK	HK		
mac_ui_lps_qa_rpt		01/31/97	XJ	HK		
mac_ui_prop_l0r_conf.fmb	02/05/97	02/07/97	HK	HK		
mac_ui_prop_l0r_params.fmb	02/05/97	02/07/97	HK	HK		
mac_ui_resend_failed_dan.fmb		02/07/97	AH	AH		
mac_ui_resend_susp_dan.fmb		02/07/97	AH	AH		
mac_ui_restage.fmb		01/10/97	MW	MW		
mac_ui_send_data.fmb		01/10/97	XJ	XJ		
mac_ui_set_dan_trans_state.fmb		01/10/97	XJ	XJ		
mac_ui_set_outfile_flag.fmb		02/07/97	AH	AH		
mac_ui_start_copy_to_tape.fmb		01/10/97	MW	MW		
mac_ui_stop_copy_to_tape.fmb		01/10/97	MW	MW		
mfp_CalL0rExtract.c	MFP	02/05/97	SG			
mfp_CalWriteFile.c		02/05/97	SG			
mfp_Main.c		02/20/97	LG			
mfp_MainColVcdQA.c		02/18/97	LG			
mfp_MainExtractTime.c		02/14/97	SG			
mfp_MainQASubGen.c		02/18/97	LG			
mfp_MainQAThrTest.c		01/10/97	LG	LG		
mfp_MainTermHandler.c		01/24/97	SG	SG		
mfp_MscdL0rExtract.c		02/05/97	SG			
mfp_MscdWriteFile.c		02/05/97	SG			
mfp_db_GetParms.c	01/17/97	01/31/97	LG	SG		
mfp_db_GetThres.c	01/24/97	01/31/97	LG	SG		
mfp_db_InsertMjf.c	01/17/97	01/31/97	SG	SG		
pcd_DescribeScene	PCD	12/10/96	12/20/96	01/03/97	DC	DC
pcd_EndofSISceneCleanup		12/10/96	01/17/97	01/24/97	HV	DC
pcd_ExtraScenesAtEnd		12/10/96	01/31/97	02/07/97	HV	DC
pcd_ExtraScenesAtStart		12/10/96	01/17/97	01/24/97	YO	DC

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pcd_FlushSavedScene	12/10/96	12/20/96	01/03/97	DC	DC	
pcd_MainComputeHds	11/15/95	11/15/95	01/03/97	LC	MW	
pcd_MainDetSceneDescription	12/10/96	02/07/97	02/14/97	RM	DC	
pcd_MainDetermineScenes	12/10/96	02/07/97	02/14/97	LC	DC	
pcd_MainExtractWords	11/15/95	11/15/95	01/03/97	RM	MW	
pcd_MainFormatWords	11/15/95	11/15/95	01/03/97	RM	MW	
pcd_MainSunAzimuthElev	11/15/95	11/15/95	12/20/96	YO	MW	
pcd_MainSunPos	11/15/95	11/15/95	12/20/96	YO	MW	
pcd_ReportSavedScene	12/10/96	12/20/96	01/03/97	DC	DC	
pcd_RetrieveSavedScene	12/10/96	12/20/96	01/03/97	DC	DC	
pcd_XmitScene	12/10/96	12/20/96	01/03/97	DC	DC	
pcd_db_GetPrevWRSScene	11/15/95	11/15/95	01/03/97	XJ	MW	
pcd_db_GetTimeOffset	12/10/96	01/17/97	01/24/97	XJ	RM	
pcd_db_GetValidParms	11/15/95	11/15/95	01/17/97	MW	MW	
pcd_db_GetValidSceneParms	11/15/95	11/15/95	01/17/97	XJ	MW	
pcd_db_GetValidThres	11/15/95	11/15/95	01/17/97	MW	MW	
rdc_CalcAcctInfo	RDC	12/20/96	02/14/96		JH	
rdc_ConnectToDevice		12/20/96	02/14/96		JH	
rdc_DeIsolateProcess		12/20/96	02/14/96		JH	
rdc_DecodeArg		12/20/96	02/14/96		JH	
rdc_DeleteRDCFiles		12/20/96	01/28/96		MD	
rdc_GenDataRcvSumReport		12/20/96	02/14/96		HK	
rdc_GenLabel		12/20/96	02/14/96		BS	
rdc_Init		12/20/96	02/14/96		JH	
rdc_IsolateProcess		12/20/96	02/14/96		JH	
rdc_Main		12/20/96	02/14/96		JH	
rdc_MainCapture		12/20/96	02/14/96		JH	
rdc_MainCleanup		12/20/96	02/14/96		JH	
rdc_PrintLabel		12/20/96	02/14/96		BS	
rdc_RestageCptr		12/20/96	02/14/96		BS	
rdc_ResumeProcess		12/20/96	02/14/96		JH	
rdc_Save		12/20/96	02/14/96		BS	
rdc_SetOnLineFlag		12/20/96	01/28/96		MD	
rdc_ShutDown		12/20/96	02/14/96		JH	
rdc_ShutDownRDC		12/20/96	02/14/96		JH	
rdc_StopSaveRestage		12/20/96	02/14/96		BS	
rdc_SuspendProcess		12/20/96	02/14/96		JH	
rdc_TermRestageSig		12/20/96	02/14/96		BS	
rdc_TermSaveSig		12/20/96	02/14/96		BS	
rdc_TestData		12/20/96	02/14/96		JH	
rdc_TestDataTrans		12/20/96	02/14/96		JH	
rdc_UpdRDCAcct		12/20/96	01/28/96		MD	
rdc_UpdateDb		12/20/96	01/28/96		MD	
rdc_WritetoAcctFile		12/20/96	01/28/96		MD	
rdc_db_WriteAcctToDb		12/20/96	01/28/96		MD	
rdc_db_WriteOnLineFlag		12/20/96	01/28/96		MD	

Agenda



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- n **System Level Issues – Dan Ferry**
- n **Subsystem Design Deltas – Subsystem Leads**
- n **Documentation Plans – Dan Ferry**
- n **Lessons Learned – Dan Ferry**
- n **Unit Status Database – Dan Ferry**
- n **Schedule – Nate Daniel**
- n **Action Items and Questions – Nate Daniel**

MO&DS DIRECTORATE CODE 500	Landsat 7 Processing System BDR <i>Schedule</i>	
	Conduct Build 3 requirement review	Oct 9, 1996
	Design Release 2	Oct and Nov 1996
	Start Release 1 system testing	Nov 25, 1996
	Conduct Build 3 design review	Dec 11, 1996
	Submit Build 3 ICCR/CCR list (with analysis) for project approval	Jan 10, 1997
	Resolution of open issues	Jan 10, 1997
	Deliver Release 1 to Goddard	Jan 20, 1997
	Code and unit test Release 2	Dec 1996 through Feb 1997
	Start subsystem testing	Feb 21, 1997
	Start Release 2 integration	Mar 21, 1997
	Start Release 2 system testing	Apr 21, 1997
	Deliver Release 2 to Goddard	Jun 23, 1997

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Acronyms



ACCA	Automatic Cloud Cover Assessment
API	application programming interface
BDR	build design review
BRR	build requirement review
CADU	channel access data unit
CCR	change control request
CM	configuration management
COTS	commercial off-the-shelf
DAA	data availability acknowledgment
DAN	data availability notice
DB	database
DDA	data delivery acknowledgment
DDN	data distribution notice
DFCB	Data Format Control Book
DLT	digital linear tape
DSI	delivered source instructions

Acronyms (Cont'd)



ECS	EOSDIS Core System
EOL	end of line
ETM+	Enhanced Thematic Mapper Plus
EU	engineering unit
FIFO	first in first out
HDF	hierarchical data format
HPDI	high-speed parallel data interface
IAS	Image Assessment System
ICCR	internal change control request
IDD	interface description document
IDP	Image Data Processing
IDPS	Image Data Processing Subsystem
IPC	interprocess communication
I&T	integration and test
JPEG	joint photographic expert group
LDT	LPS Data Transfer

Acronyms (Cont'd)



LDTS	LPS Data Transfer Subsystem
LPS	Landsat 7 Processing System
MACS	Management and Control Subsystem
MFP	Major Frame Processing
MFPS	Major Frame Processing Subsystem
MSCD	mirror scan correction data
MWD	Moving Window Display
PCD	Payload Correction Data
PCDS	Payload Correction Data Subsystem
PDR	preliminary design review
RCS	Revision Control System
RDCS	Raw Data Capture Subsystem
RDPS	Raw Data Processing Subsystem
RID	review item disposition
ST	System Test
TBR	to be resolved

Acronyms (Cont'd)



UI	user interface
UT	universal time
VCDU	virtual channel data unit
VCID	virtual channel identifier
WRS	World Reference System